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Volume 20, Number 45

The Extended Enterprise Issue

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- Travelocity's flight to open systems
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- The hottest methods for protecting Web applications
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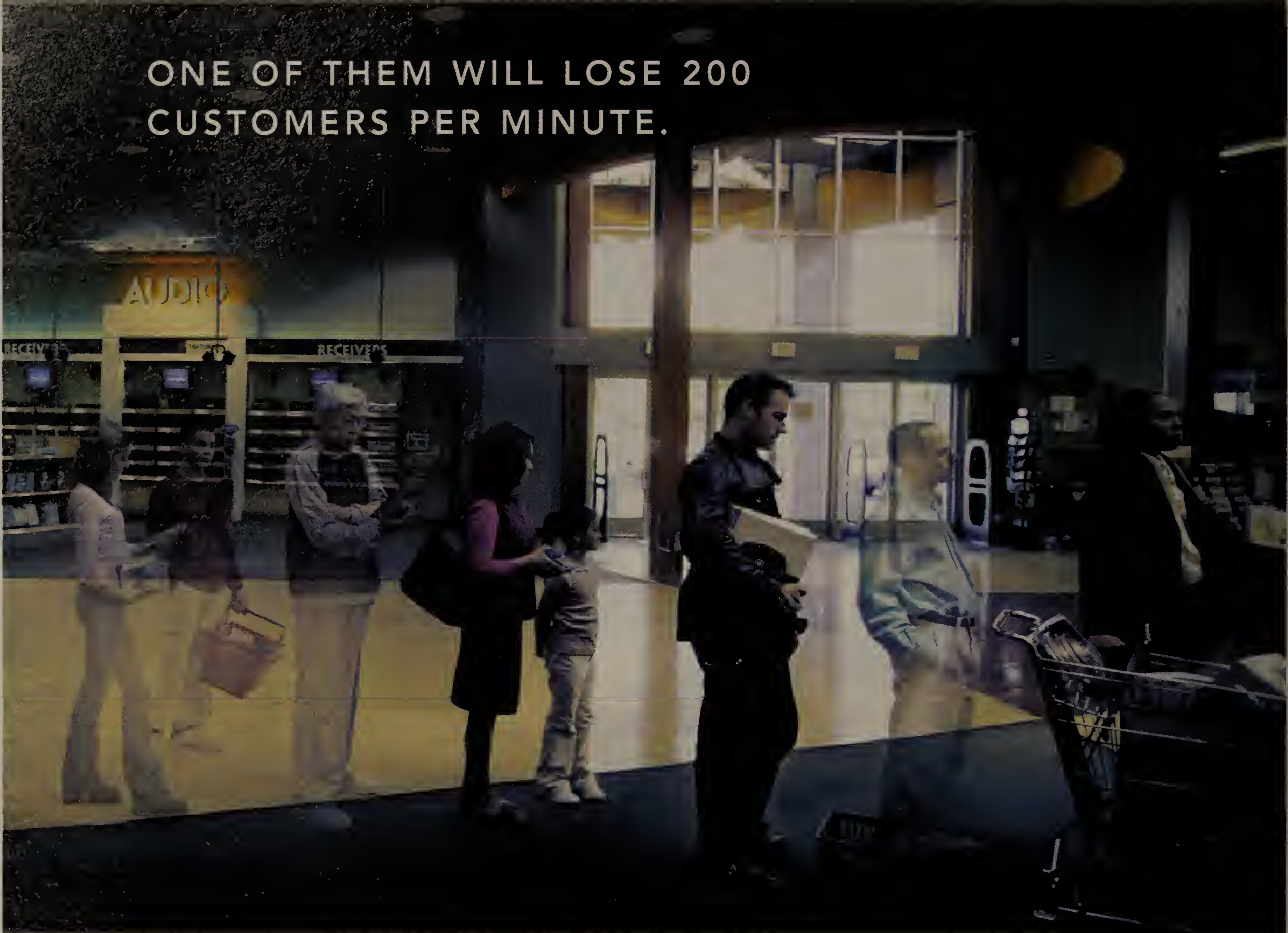

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News

Cisco, Nortel to embrace SSL-based VPNs

■ **BY TIM GREENE**

Cisco and Nortel — arguably the two biggest names in IP Security VPNs — are getting ready to shake up the fast-growing Secure Sockets Layer segment of the market, which they've largely ignored until now.

Cisco today is expected to announce that in January it will add SSL support to its existing VPN 3000 IPSec concentrators. The support will come as a free software upgrade called WebVPN for current customers that have support contracts. Cisco says that over time it will add SSL support to its IOS, making the functionality available to other devices.

Meanwhile, Nortel says it will add SSL support to its Contivity IPSec VPN gear in the second quarter of next year. The company next month is set to release a new hardware platform called VPN Gateway 3050 that will support SSL remote access. An upgrade to the 3050 in the second quarter of next year will support IPSec VPNs.

Nortel already has SSL support on its Alteon load-balancing switch, but this is its first IPSec/SSL product. The new device will cost about $11,000, one-third less than a comparable Alteon box.

The network giants, Cisco in particular because of its enormous corporate installed base, are likely to shake up the young SSL VPN world, which until now has been dominated by relatively new companies with a single focus on SSL remote access. SSL remote access has grown in popularity because it lets users connect securely to corporate networks from any Internet-connected computer, eliminating the need to distribute and manage client software on remote machines. This also gives users more options for connecting, such as at Internet kiosks and wireless hot spots, or via home computers. SSL also can save companies money because it requires less administration.

A wealth of SSL remote-access companies sprung up — some have grown, some have been bought and some have folded — before Cisco and Nortel came up with hybrid SSL/IPSec offerings. The list includes AEP, Aspelle (now folded), Aventail, Netilla, Neoteris (bought by NetScreen Technologies), SafeWeb (bought by Symantec) uRoam (bought by F5 Networks) and Whale Communications. These companies sell gear priced from $3,000 to $10,000, says Joel Conover, principal analyst of enterprise infrastructure for Current Analysis.

Adding SSL functionality at no charge will pressure other vendors to drop prices, which were destined to come down anyway. "Usually when you add functionality, you charge for it," Conover says.

Even before Nortel and Cisco

See VPNs, page 18

The truth about SSL

Pros	Cons
• Uses standard Web browsers, not separate clients.	• No support for voice and streaming traffic.
• Controls access application by application.	• No site-to-site connections.
• Requires less administration.	• Might not support all applications.
• Opens networks to partners without altering partner networks.	• Doesn't allow access to individual workstations.

Tech industry starts to show signs of life

Promising indicators suggest telecom recovery looming.

■ **BY JIM DUFFY**

Nasdaq is up 40% this year and telecom-specific indexes are also up dramatically. Lucent just turned its first quarterly profit in three years, while Nortel expects this to be its first profitable year since 1997. MCI, meanwhile, is set to emerge from bankruptcy healthier and hungrier.

While not all is rosy, more signs are pointing toward the telecom industry finally starting to recover from the slump it's been in for more than three years.

North American carriers' capital expenditures will be down by one-fifth from last year, though they should get more for their money given continued deep discounts. These carriers plan to spend $50 billion this year on gear such as IP edge, core router and metropolitan optical products, according to Infonetics Research. And makers of carrier-grade equipment see hope in carrier-like RFPs such as the Department of Defense's $900 million Global Information Grid-Bandwidth Expansion effort.

Then there's Cisco. Its orders from carriers jumped 10% sequentially and 20% over last year's first quarter — the cherry on top of a first quarter that saw earnings rise 76% from a year ago on the highest revenue recorded by the company in three years.

"All of the indicators are confirming a quicker pick-up than we had expected," says Thomas Nolle, president of consultancy CIMI.

"During this three-year downturn, we continued to work very hard to lower our operating costs, to improve our processes and to improve our position in growth products. The results of that have been pretty exciting."

Betsy Bernard
President, AT&T

A changed landscape

Even if the industry is emerging from its low point,

See Recovery, page 16

IPOs make a cautious, quiet return.

■ **BY CARA GARRETSON**

Private network companies in search of capital might begin looking to IPOs again, as signs point to the return of this financing vehicle that hasn't been in favor since the Internet bubble burst in 2000.

Experts cite a number of factors for the return of the term IPO to the vocabulary of network industry entrepreneurs, venture capitalists and institutional investors. Among those are a stabilizing economy, increased IT spending, strong financial performance of some key public companies in the technology industry and a few solid stock offerings over the past few months.

However, today's IPO is more sober than the high-flying offerings of just three years ago. Experts say now a company must have a shipping product with an impressive customer list and show consecutive quarters of profits before investors will welcome their shares on the public market. They say the IPO window will not open for everyone; only companies in hot product areas such as semiconductors, wireless networks and e-mail security, where IT spending is particularly concentrated, are likely to pull off a successful offering.

"It's clear investors are interested in growth stories again, and that's good news for technology companies," says Joe Muscat, a partner with Ernst & Young's emerging and growth markets practice. "But there's no question that investors are more rigorous today. Companies that are most successful act like public companies well before the initial offering."

With the return of the IPO and the capital it raises comes hopes for greater research and development spending and, theoretically, higher-

See IPOs, page 14

NewsBits

Microsoft posts $5 million 'bounty' fund

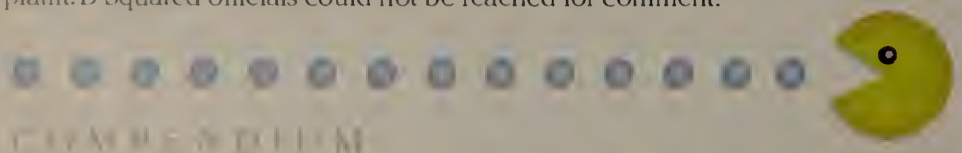
■ Microsoft is dipping into its sizeable cash reserves to offer rewards of $250,000 each to anyone who can help track down the authors of the SoBig and Blaster worms that wreaked havoc with Microsoft software and crippled many corporate networks. Two people have been arrested for unleashing variants of Blaster, but the original author remains at large. The bounties are part of a $5 million fund Microsoft has established to help law enforcement snare computer bad guys. The company got a show of support during a news conference last week from the FBI, the Secret Service and Interpol. Microsoft has spent millions of dollars over the past two years on its Trustworthy Computing initiative, which is designed to produce secure code, but security vulnerabilities have persisted in its software, including 47 this year. Now the company is committing millions of dollars to attack the problem from the other end of the spectrum — those who exploit those vulnerabilities.

Network Appliance snaps up Spinnaker

■ Network Appliance is buying privately held Spinnaker Networks for about $300 million in an all-stock deal aimed at boosting Network Appliance's high-end storage products and get its "storage grid" architecture to market more quickly, executives from the companies said last week. Spinnaker develops enterprise-class network-attached storage products, with a family of NAS servers and a global distributed file system, Spin FS, on the market. Network Appliance provides storage network infrastructure wares. Network Appliance executives did not offer a time frame for when the storage grid architecture will be released, but pledged an update in the coming weeks.

FTC targets pop-up scheme

■ The Federal Trade Commission has filed suit against a company that allegedly exploited a vulnerability in Microsoft's Windows system to barrage users with pop-up ads using a feature intended for administrative alerts. The tactic involved the Windows Messenger Service, a software feature distinct from Microsoft's similarly named MSN Messenger and Windows Messenger instant-messaging applications. The Messenger Service is part of the Windows XP and Windows 2000 operating systems that let network administrators send messages to users, such as notifications about the status of print jobs. The feature proved problematic as external parties figured out how to hijack the Messenger Service and use it to send unsolicited information such as ads to Internet-connected computers. The company targeted by the FTC, D Squared Solutions, used Messenger Service to flash ads touting its pop-up blocking software, which it sold for $25 to $30, according to the FTC's complaint. D Squared officials could not be reached for comment.



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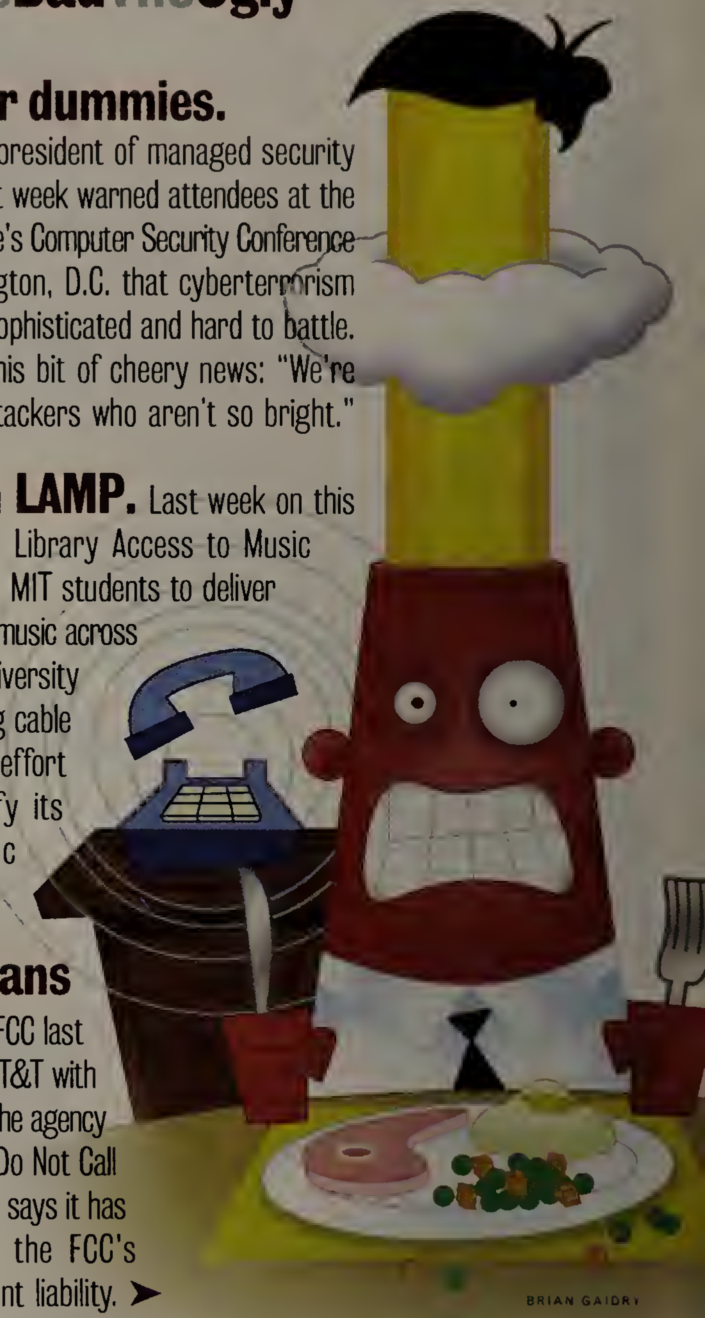
■ TheGoodTheBadTheUgly

Net attacks for dummies.

Norm Laudermilch, vice president of managed security services for VeriSign, last week warned attendees at the Computer Security Institute's Computer Security Conference and Exhibition in Washington, D.C. that cyberterrorism is becoming ever more sophisticated and hard to battle. But he did pass along this bit of cheery news: "We're good at catching the attackers who aren't so bright."

Plug pulled on LAMP. Last week on this page we celebrated the Library Access to Music Project, an effort by two MIT students to deliver free and legal on-demand music across campus. However, the university has suspended the analog cable television system-based effort while it seeks to clarify its licenses for the music content.

Do not call means do not call. The FCC last week proposed slapping AT&T with a $780,000 fine for what the agency says are violations of its Do Not Call telemarketing rules. AT&T says it has been cooperating with the FCC's investigation into apparent liability. ➤



BRIAN GAIDRY

Google moves to the desktop

■ Google is looking to make inroads into the desktop with last week's rollout of its free Google Deskbar software, which lets Windows users search the Web and applications without opening a browser. The Deskbar appears as a small inset window on the Windows toolbar and lets users search the Web without leaving desktop tasks as long as the computer is connected to the Internet. Keyboard shortcuts let users run queries, typing "Ctrl+Alt+G" to perform Google searches from applications, for example. There are also keyboard shortcuts for Google News, Images and the company's Froogle shopping comparison searches. The Deskbar requires the Windows 98, ME, 2000 or XP operating systems, and Internet Explorer 5.5 or higher to run.

Gartner: Yes to IP VPNs; not yet to IPv6

■ IT executives shouldn't worry about bringing IPv6, 3G or 64-bit computing to the desktop until as late as 2007 or 2008, Gartner analysts advised last week at the the company's Symposium/ITxpo conference in Cannes, France. On the other hand, IP VPNs, Wi-Fi and replacement desktop machines all should be the subject of careful reflection today. Assigning technologies to three categories, "Act now," "Next year" and "Not yet," the analysts gave their views of how attendees should prioritize new technology introduction to the enterprise. IPv6 is strictly of interest to service operators and now is not the time for corporations to worry about this new technology, they said. But the analysts recommended that companies should act now to replace frame relay, ATM and leased-line connections with IP VPN links.

Linux kernel attack thwarted

■ An attempt by an unknown attacker to plant a Trojan virus in the Linux kernel has been blocked. Kernel developers last week discovered that a server hosting a copy of the Linux source code had been compromised and that a Linux kernel file had been changed to allow the attacker unauthorized access to operating systems built with the affected source code. The machine in question, Kernel.bkbits.net, hosted a version of the Linux source code that was used by only a handful of Linux developers. The compromise was detected and corrected within 12 hours.

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Novell buys its way deeper into Linux

BY DENI CONNOR AND JENNIFER MEARS

“We will be the No. 1 company in the [Linux] business over the coming years.”

Chris Stone
Vice chairman, Novell

Network executives and industry analysts are applauding Novell's move to acquire SuSE Linux, saying that it signals a new beginning for Novell and a boost for open source.

But they also say there are challenges ahead as Novell, which built its business on its proprietary NetWare operating system, attempts to reinvent itself as an open source player.

“This brings Novell and the word excitement back into the same sentence. It brings them back onto the radar screen in places that they've largely ignored for years. . . . And it helps Linux find a center,” says Dan Kusnetzky, vice president of systems software at IDC. “Now the trick is can Novell allow the Linux community to still be a community instead of trying to run it as a corporate entity?”

Novell initially underscored its commitment to open source earlier this year when it announced that all its network services would run on Linux. Since then, Novell also bought Linux desktop, management and collaboration software provider Ximian.

SuSE, which Novell last week announced plans to buy for $210 million, completes Novell's Linux picture by letting the company provide products that span the desktop, server and applications that sit on top of the server operating system, says Novell CEO Jack Messman. But the question is, how will Novell integrate its new Linux products with its flagship NetWare systems.

Novell has a spotty record when it comes to integrating acquired technology, analysts say. Its forays with WordPerfect and Unix in the early '90s were busts.

“Novell did a very poor job with UnixWare. They really screwed that up,” says Bill Claybrook, an analyst with Aberdeen Group. “But I don't think they'll make the same mistake with Linux. It's not like Linux is their operating system, so they can't do whatever they want with it. They have to be cognizant of what open source demands of you as a vendor.”

Still, some customers worry that Novell might be too aggressive when it comes to adding proprietary extensions to SuSE Linux and could dilute the open-source nature of the operating system.

Ross Vandegrift, a network administrator at Seitz Technical Products in Avondale, Pa., which runs NetWare and Linux, says he'll watch the merger closely.

“If Novell is wise in their moves, they will add on to core distributions as modularly as possible,” he says. “History has shown that closely integrating proprietary extensions with free software has been a reliability nightmare. . . . So long as Novell sticks to using the published, well-known, widely available interfaces, I don't foresee a problem.”

Jim Michael, IS manager for the city of Chesterfield, Mo., is concerned about just the opposite. He worries that Novell won't add enough proprietary extensions, resulting in Linux products that are less functional than traditional NetWare. He's worried Novell's Linux focus could “sound the final death knell of NetWare.”

“I want to continue to use NetWare, but if all of Novell's development energy is going into Linux products, logic tells me that the NetWare development will be getting the short end of the stick and thus Novell's own applications running on NetWare will quickly start to suffer,” he says.

Another hurdle in Novell's Linux plans is that SuSE and Ximian have overlapping products. Ximian has its GNOME desktop, while SuSE has KDE. Management products also overlap: SuSE's Autoyast, Ximian's Red Carpet and Novell's ZENworks.

Novell Vice Chairman Chris Stone says that while development efforts have been converged, no decisions have been made as to which products will remain.

“Right now ‵ it is in product development, and we need to do the integration work to figure out from a branding and naming point how that will work out,” he says. “We will be the No. 1 company in the [Linux] business over the coming years.”

Stone conceded that development of NetWare services for Linux would favor SuSE first, before Red Hat or other Linux distributions.

Joe Poole, technical director at Boscov's Department Stores in Reading, Pa., runs SuSE Linux in his data center and sees the merger as good news, but says Novell's ultimate commitment to Linux will be what counts.

“Novell has got our attention,” he says. “What they do over the next six months will tell us whether they're really on the comeback trail or just experimenting.” ■

IM mgmt. may take years to conquer

BY JOHN FONTANA

As end users continue to tap services that bring instant messaging into corporate networks, IT executives are realizing they will need sophisticated management tools to create an instant-messaging infrastructure.

Corporate IT executives, at a teleconference last week sponsored by research firm The Radicati Group, said for instant messaging to be a network service, IT must ensure uptime, quality of service (QoS) and scalability.

“Health and availability is an issue as the number of users grows. An IT-managed service has to be a robust 24-7 service, an IM dial tone in a way,” said Brett van Gelder, manager of messaging and collaboration for an undisclosed large professional services firm, during the teleconference.

Today, nearly 80% of instant messaging in companies is done over public instant-messaging services such as AOL, MSN and Yahoo, exposing companies to security risks, according to Radicati. In response, companies are deploying gateway technology so IT can control user names, and log and archive traffic to meet government regulatory demands.

But the hybrid approach of corralling consumer services with corporate gateways isn't a long-term solution because companies likely will build internal instant-messaging infrastructure just as with e-mail, according to experts. Radicati predicts there will be 349 million corporate instant-messaging accounts by 2007.

Software for that infrastructure is at the forefront, with IBM/Lotus Instant Messaging server, Microsoft's Live Communications Server and products from small vendors.

If instant messaging becomes a network application run by IT, companies will need to consider health and availability, usage tracking, local routing and integration of instant messaging with applications and business workflow, experts say.

Management also becomes imperative when presence, which uses the instant-messaging infrastructure to show who is online, is embedded in other applications. Also, when standards arrive such as the Extensible Messaging and Presence Protocol, Session Initiation Protocol, and SIP for Instant Messaging and Presence Leveraging Extensions, interoperability and voice support will make QoS a core concern for real-time communication.

“In the past 12 months, we've seen a move to embed presence in applications, so now there is a lot more riding on the IM infrastructure than just two people chatting,” van Gelder said, noting his company was lucky to have committed to an enterprise platform early, which discouraged the use of public instant messaging.

The firm supports about 50,000 users per day on 12 IBM/ Lotus Instant Messaging servers and uses DYS Analytics' Collaboration Control to monitor the health, availability and performance of the global infrastructure.

But instant-messaging management needs won't materialize overnight, and it will take companies years before consumer services are washed off desktops.

“People are just starting to realize the value of real-time communication, but still there are a lot of executives who don't like it,” says Genelle Hung, an analyst with Radicati. “It could be five years until widespread adoption.”

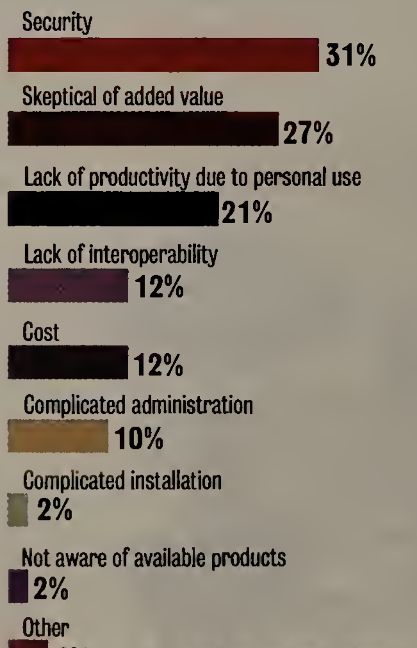
That means companies have time to think ahead.

Vendors such as Akonix, FaceTime Communications and IMLogic supply the gateway tools that let companies overlay their domain names on consumer instant messaging and manage traffic.

“We're asking questions about how do we control our name space and create a corporate ID,” said Jim Pullen, senior systems engineer of Cinergy, who also participated in the Radicati teleconference. Pullen deployed IMLogic to control the outbreak of consumer instant messaging at Cinergy. “We need to know who we are, and we need to bring interoperability and scalability into the IM environment, he says” ■

IM in the workplace

A recent study showed that nearly 70% of more than 50 companies surveyed were using IM, but that a wide range of concerns over the technology still exist.



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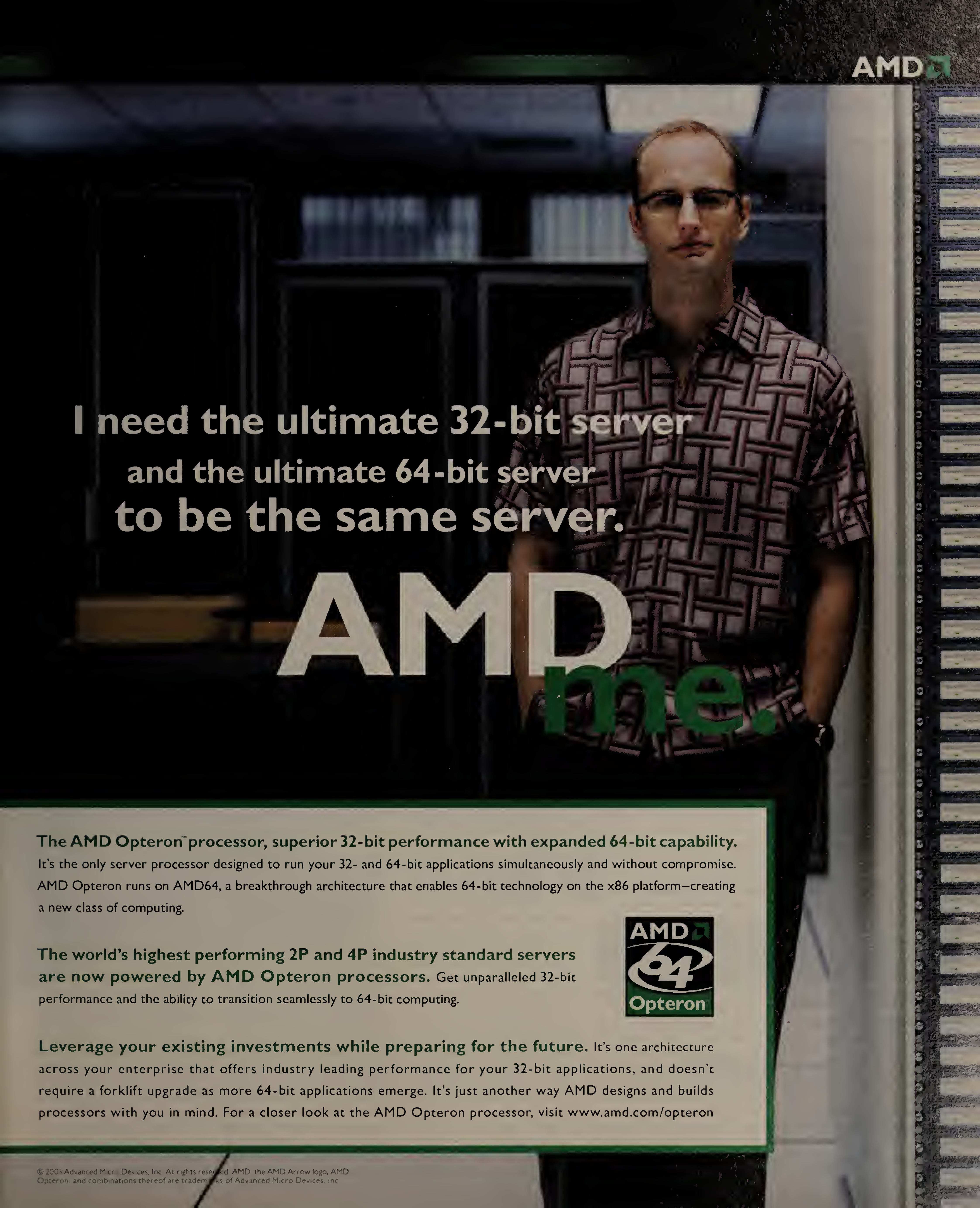
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Vendors hawk Sarbanes-Oxley wares

BY ANN BEDNARZ

Like tax accountants in April, software vendors are lining up to help companies comply with regulatory issues set forth in the Sarbanes-Oxley Act of 2002. IBM, Oracle and SAP are among the latest to unveil new and upgraded products designed to make it easier for companies to put in place internal processes and systems that will help them meet the requirements of the law.

There's an active audience for these wares, according to analysts. A Meta Group poll found 90% of companies are engaged in or planning Sarbanes-Oxley compliance projects.

Under the act, publicly traded companies must comply with stringent financial reporting and disclosure requirements. Some provisions already are in effect, such as Section 302 that requires key executives to certify the accuracy of their companies' financial filings.

Other rules are pending, such as the so-called whistle-blower provision that requires companies to provide ways for employees to anonymously submit accounting concerns.

The effect on IT systems is varied. Some companies have met the act's initial certification requirements with little disruption to financial reporting processes, ARM Research says. However, certain pending provisions have broad IT implications that could require system overhauls.

For example, Section 404 requires companies to certify financial reporting processes and the structure of internal audit controls. Companies need to document and attest not only to final numbers, but also the processes by which they arrived at those numbers — something many haven't done religiously, says John Hagerty, vice president at AMR Research.

The law won

Some sections of the Sarbanes-Oxley regulations will affect companies' business technology systems.

Section 301

"Whistle-blower" provision requires companies to establish procedures for the receipt, retention and treatment of anonymous submissions by employees of concerns regarding questionable accounting or auditing matters.
Status: Effective date not set.

Section 404

Requires companies to establish and certify a system of internal controls and processes used to obtain financial results.
Status: Goes into effect June 15, 2004.

Section 409

Requires companies to disclose — in real time and in plain English — to the public any material events that could affect a company's financial condition or operations.
Status: Effective date not set.

"A lot of companies are trying to figure out exactly what the auditors will require, and then put a process or system in place to support that documentation effort," he says. "Often the philosophy is in place, but the actual documentation may not have been kept up to snuff."

What is certain is that companies will need to spend money to implement the required documentation, procedures and controls. AMR Research says Sarbanes-Oxley compliance will drive companies to spend more money in areas such as IT, business process changes, corporate governance and consulting. Collectively, the Fortune 1000 companies will spend $2.5 billion this year on the act's initiatives, the firm estimates.

Giga Information Group estimates individual companies' compliance will cost between $5 million and $10 million.

Attracted by the prospect of available IT spending money, vendors with expertise in business intelligence, content management, ERP, middleware, portals, collaboration and business process management are coming out with targeted Sarbanes-Oxley products. "What vendors smell in Sarbanes-Oxley is an initiative that needs to get solved pretty quickly," Hagerty says.

There's no one type of vendor that companies should look to for help with Sarbanes-Oxley, Hagerty says. For example, it might make sense for a company to turn to an ERP vendor, because ERP software is the source for much financial data. But if a company is decentralized and running multiple iterations of ERP software or operating in a heterogeneous environment, it might make more sense to turn to a software provider that can help aggregate and analyze data from multiple sources.

McData invested in products from two software vendors in its compliance efforts: portal tools from risk consulting and internal audit firm Protiviti, and content management software from Documentum. Protiviti supplies organizational and financial models, process classification schemes and risk information data, and the Documentum repository stores all unstructured, Sarbanes-Oxley-related content, says Paul Brothe, director of internal audit at the Broomfield, Colo., storage network company.

"We looked to Documentum for a tool that we could link into the Protiviti portal to actually put the formal documentation into an electronic format that has version control and authorship control," Brothe says.

While observers have compared Sarbanes-Oxley compliance requirements with Y2K efforts, Brothe says the regulatory effort is broader. "Y2K required a lot of work that took you up to a date. Beyond that date, if nothing fell apart, you just didn't worry about it," he says.

"This is an ongoing fundamental business change," he adds.

Here are some of the latest Sarbanes-Oxley offerings:

- SAP last week announced Compliance Management for Sarbanes-Oxley Act. PricewaterhouseCoopers helped SAP develop the software, which extends functionality in mySAP Financials and mySAP ERP to cover the law's requirements. Highlights include tools to document, model, test and monitor business processes and existing internal controls. New portal features are aimed at helping companies handle anonymous submissions from employees.
- Oracle last week announced upgrades to its Oracle Treasury software, which is designed to help corporate treasury departments — which oversee banking activity and financial market interaction — ensure compliance with risk-exposure policies. The new version adds payment-processing validation features to address fraud prevention; straight-through processing capabilities for money-market transactions; and access to real-time cash-flow information for better forecasting and investment decision-making.
- IBM recently introduced bundles of hardware, software and services for helping companies comply with federal regulations such as Sarbanes-Oxley, the Patriot Act and the Health Insurance Portability and Accountability Act. IBM E-mail Archive and Records Management Service is a hosted service that automates the capture, archiving and retrieval of e-mail, instant messages and other documents. DB2 Content Manager for Data Retention Compliance addresses data archiving, retention and retrieval requirements.
- Business process management software maker IDS Scheer next month is expected to preview its Aris Sarbanes-Oxley Audit Manager, which is designed to help companies manage the process of certifying internal controls. The software routes, tracks and stores control policies and can alert a company when its controls might be steering away from Sarbanes-Oxley compliance.
- Financial software specialist Nth Orbit this week is expected to announce upgrades to its flagship internal controls and assurance product, Certus. New features include workflow tools that let users graphically map out complex financial processes and view the status of each step.
- Business intelligence software maker SAS recently unveiled software that combines its analytic, data warehousing and workflow technologies in a regulatory-oriented package. SAS Corporate Compliance for Sarbanes-Oxley helps companies consolidate and analyze financial data from disparate sources. Monitoring and reporting tools provide multiple views of compliance status and can trigger alerts when a company is in danger of not attaining certain requirements.
- PeopleSoft last month announced Enterprise Internal Controls Enforcer, a module in its suite of financial applications designed to automate and enforce internal controls required by Sarbanes-Oxley. The product includes diagnostic tools that test and continuously monitor controls within PeopleSoft's transaction systems, alerting executives when users make significant configuration alterations, such as a change in revenue recognition methods.
- Content management software maker FileNet last month unveiled records management software aimed at tracking electronic and physical records from creation to disposal. FileNet Records Manager makes use of the software maker's monitoring and analytic capabilities to help companies understand how records are used within their businesses and how they can adjust records retention policies to meet regulatory requirements. FileNet Records Manager is due to be released in the first half of next year.
- Portal software firm Plumtree recently upgraded its Sarbanes-Oxley Act Accelerator, which combines business-process management tools from HandySoft with Plumtree's collaboration, search and portal technology. The new version adds support for the Committee of Sponsoring Organizations of the Treadway Commission framework — a standard methodology that companies use to establish and manage internal controls. ■

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IPOs

continued from page 7

quality products. "Funding and IPOs allow the companies with the good ideas to expand more rapidly — more development, more sales and marketing — similar to the growth in companies we saw in the early to mid-1990s," says Doug Carlisle, managing partner with venture capital firm Menlo Ventures.

In addition, with the stringent, government-imposed financial reporting rules now placed on public companies to remedy recent corporate accounting scandals, start-ups must have their back offices in order before even thinking of going public. This means companies that go public today are more likely to survive — unlike many of the less-mature start-ups that went public during the dot-com craze, then suddenly vanished. And this will instill greater confidence in IT departments looking to standardize on their products.

Building buzz

Among the recent IPOs building investor confidence in technology offerings are:

Company	Description	IPO date	Opening share price	Amount raised	Recent trading price*
DigitalNet Holdings	Government contractor specializing in security	Oct. 10	$17	$98 million	$23.45
Netgear	SOHO network equipment maker	July 31	$14	$113 million	$14.41
iPass	Virtual network operator	July 24	$14	$98 million	$18.35

*Trading price as of 12 p.m. EST on Nov. 6.

Of the companies with recent public offerings that have begun to rebuild investor confidence (see graphic), small office/home office (SOHO) network equipment maker Netgear has become a sort of poster child for the new-age IPO. The company issued stock in July at $14 per share and raised $113 million, which it will use to pay back a loan to Nortel, fund research and development and expand its sales channel, says Patrick Lo, Netgear's chairman and CEO.

As a public company, Netgear now has the capital and the high profile to compete with other companies in this segment, most of which are also public. "Now that we're public, we've leveled the playing field," Lo says.

Since its IPO, Netgear's shares have traded above $20 and haven't dipped below offering price. The company's offering was successful because it is well-positioned in an exploding market, says Samuel Wilson, a senior analyst who tracks the company for JMP Securities.

"Netgear is in a high-growth market — networking in the home — at a time when broadband penetration is going up," Wilson says. "Other companies should take heart to know that the old playbook is back in effect; Netgear was profitable, had healthy revenues and no customer concentration issues."

More IPOs to come?

These recent success stories, plus the perceived improvement in the economy, have inspired more companies to consider IPOs. Search site Google is rumored to be planning an offering for later this year or early next, which will no doubt create significant buzz and inspire other companies to do the same, says Jeffrey Hirschkorn, senior IPO analyst with IPOMonitor.com. "Google is a bellwether company," he says.

Other companies said to be considering public offerings include SOHO equipment maker 2Wire, networking software developer Motive Communications, travel Web site Orbitz and quality-of-service appliance maker Allot Communications.

However, this IPO buzz is tempered by realistic statements from entrepreneurs demonstrating they've learned lessons from the crop of CEOs whose companies flew high and fell hard during the Internet boom.

"My focus for the next six months is . . . looking forward to high growth and having a profitable year and then planning accordingly," says Scott Weiss, CEO of e-mail security appliance maker IronPort. "An IPO is simply an offspring of a large, successful company."

Another financing event that's experiencing a recent resurgence in the technology industry is the acquisition. Last week alone, Novell's acquisition of SuSE Linux and Network Appliance's buyout of Spinnaker Networks totaled more than $500 million.

Some say start-ups — particularly in the network market — are more likely to be acquired than go public. "I'm not saying there aren't opportunities to go public," says Pascal Luck, managing director with venture firm Core Capital. "I just think that for every 10 companies that get bought, one will go public." ■

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IBM adds to Workplace lineup

■ **BY JOHN FONTANA**

IBM last week added two components to its Lotus Workplace platform and upgraded two others as it continues to remake its collaboration technology to run on WebSphere and provide an à-la-carte approach to deploying and integrating software.

New to the Workplace platform are Workplace Team Collaboration 1.1, which combines instant messaging, conferencing and online workspace; and Workplace Collaborative Learning 1.1 for online classes.

The Workplace platform is a set of collaborative components derived from Lotus Domino that run within IBM's WebSphere Portal framework. The components are built on Java 2 Platform Enterprise Edition and run on WebSphere Application Server and DB2 database.

IBM also released enhancements to its Workplace Messaging and Web Content Management components. The four components are expected to be available next month

"This is us delivering on our contextual collaboration strategy," says Mike Loria, director of advanced collaboration products

See Workplace, page 16

Venture funding holds its own during Q3

While privately held network companies still aren't attracting the venture capital dollars they used to, experts are upbeat about investments in the overall technology sector during the third quarter, which should mean more companies with good ideas will find the funding they need to bring their products to market.

Venture capitalists funneled $1.9 billion into network and related companies during the third quarter, according to an analysis of the PricewaterhouseCoopers/Thomson Venture Economics/National Venture Capital Association MoneyTree Survey done for *Network World*. That's down from the $2.2 billion invested during the second quarter, but not as low as many feared during the notoriously slow third quarter that spans the summer months.

"The fact that investments stayed relatively level with the second quarter is a significant pattern, it shows a slight uptick from what is normally expected," says Tracy Lefteroff, global managing partner for PricewaterhouseCooper's Venture Capital & Private Equity Practice. "We've definitely hit bottom, and now we're starting to see a pickup in activity."

In addition to biotechnology and healthcare, which quickly became favored sectors by venture capitalists after the Internet bubble burst in 2000, investors say they are interested in companies that produce Wi-Fi gear and services, and messaging and security vendors. For example, anti-spam companies Cloudmark, Corvigo, FrontBridge, MessageGate and Postini all received venture funding during the third quarter, while Boingo Wireless, Colubris Networks, Legra Systems, Tropos Networks and Wayport were among the Wi-Fi vendors that attracted dollars. Among the largest deals was a $50 million investment in VPN vendor Fiberlink from Technology Crossover Ventures; a $47 million investment in storage company BlueArc from Crosslink Capital, and $32 million in funding for online exchange e2Open. com by Crosspoint Venture Partners and an undisclosed firm.

Network equipment vendors saw $331 million in investments, spread across 46 deals, representing a modest amount of activity, Lefteroff says.

While observers remain confident that venture funding of technology companies is on the rise, investors stress that only those start-ups with compelling products and impressive customer lists will garner coveted venture dollars.

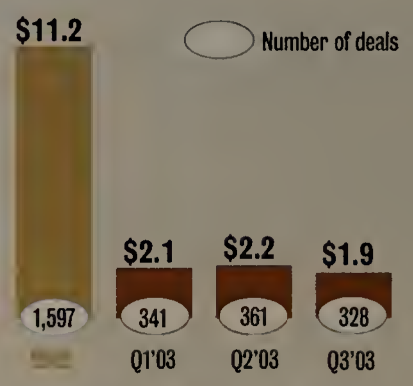
"We're much more focused on the customer and the market" than during the Internet boom, says Pascal Luck, managing director with venture firm Core Capital, which invests in network and software start-ups.

"There's a much bigger focus on customer traction and market validation of a particular product," he says.

— Cara Garretson

Shaking the tree

Recent venture capital funding in network and related companies,* in billions of dollars.



* Categories include computers and peripherals, IT services, networking and equipment, semiconductors, software and Internet communications.

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Recovery

continued from page 7

however, carriers and product suppliers will face a drastically altered business climate. Questions — such as "What if pricing and competitive pressures keep increasing?" — will abound.

"We're going to see more consolidation, more bankruptcies," says Dave Schaeffer, CEO of service provider Cogent Communications. "While we may have ended the free-fall, the industry as a whole is not yet able to attract the capital to reinvent itself, to build on a national scale 99% ubiquitous coverage of next-generation data services."

Traditional wireline carriers will be under even more pressure to compete effectively against local access alternatives, such as wireless — with number portability coming in two weeks.

"We'll likely continue to see access-line losses, which eats at the core of the carriers' revenues," says Richard Church, senior analyst for communications equipment at Wachovia Capital Markets.

SBC, for example, attributed its $523 million year-over-year drop in third-quarter wireline revenue to access-line losses. Analysts say SBC's residential lines fell by 9.4% from the second quarter.

Probe Group says the rate of this regional Bell operating company's access-line losses is roughly 3% per quarter.

RBOCs also will face off more fiercely with cable companies, which are bundling voice services with data and video, and offering it in local exchange carriers' territories. Although they're cutting spending from last year's $13.3 billion, U.S. cable multisystem operators nonetheless will spend $10.2 billion this year and $9.5 billion next, according to In-Stat/MDR.

"The cable vs. RBOC wars, those are just going to get uglier and uglier" over the next two years, said Steve Kamman, an analyst at CIBC World Markets. Kamman made his remarks last week at the annual Next Generation Networks (NGN) conference in Boston, where the outlook on the industry was decidedly mixed.

Additionally, carriers emerging from Chapter 11 bankruptcy protection — namely MCI — will have drastically reduced debt on their balance sheets. Church and others say this might continue to be a source of pressure on pricing and profitability for other carriers even though MCI has promised not to set off a pricing war to stimulate growth (see story at www.nwfusion.com, DocFinder: 8443).

Others say they are less concerned.

"Most recently when asked, [MCI Chairman and CEO Michael] Capellas said no new price wars," says AT&T President Betsy Bernard. "But he'll do what he needs to do to retain the business that he has. If you take a look at the [MCI] margins, which are half of ours, that's not a position of strength to be starting price wars."

"If MCI emerged totally debt-free with a network that was paid for, that would not give them enough of a price advantage to offset the increased advertising costs and discounting they would have to do to restore customer credibility for the basic services," Nolle says. "So they're not going to be in any better shape than the incumbent players who never went Chapter 11."

Bernard also says the overall economy, with higher unemployment than three or four years ago and no job creation, might kill demand for network services — meaning that companies are set with what they have for a contracting workforce. But even though she's not ready to say we've seen the end of the industry meltdown, she is encouraged by signs that corporations have just about completed their own restructurings during the downturn and are ready to spend again.

In the latest Network World 500 study, the majority of 500 organizations surveyed said they would increase their spending in 2003 and will do so by an average of 19% over 2002.

"Those are all things we're very excited about, and that give us and others a reason to be optimistic," Bernard says.

Start-ups need not apply

The outlook is less optimistic for smaller companies. Even well-heeled start-ups such as router maker Procket Networks (it raised $272 million in venture funding and is generating revenue) are scrambling to ensure carriers give them a fair shake at a time when they are leery of small companies that might lack the financial wherewithal and service and support infrastructures to adequately handhold their accounts. Procket COO Vito Palermo says the company plans to soon buddy up with an established telecom vendor to take it where no start-up has gone before ... alone.

Industry watchers say the days of a company like Juniper beginning operations and then taking up to one-third of the Internet router market share from incumbent Cisco won't be seen again for a long time.

"The little guys have to have partners," says Michael Howard, principal analyst and co-founder of Infonetics. "The market continues to favor the incumbent suppliers."

That's not to say that all incumbent vendors and carriers are ideally positioned to thrive now.

Interexchange carriers (IXC) will feel added pressure not just from the debt-free MCIs but from customers and from RBOCs looking to purchase rather than build nationwide infrastructures. BellSouth two weeks ago reportedly ended its long-rumored courtship of AT&T — at least for now — after blanching at the IXC's $19 billion price tag.

"If you're an IXC, you're focusing on customer retention and holding your ground for a critical period of about two years," Nolle says. "Most of the IXCs are aware that if they can sustain themselves as viable players until 2005, they have a hope of independent long-term survival. If they cannot do that, they're going to have to court an RBOC."

Naturally, Bernard feels AT&T will be in the former group.

"During this three-year downturn, we continued to work very hard to lower our operating costs, to improve our processes and to improve our position in growth products," she says. "The results of that have been pretty exciting and stunning."

AT&T Business — the division that sells services to corporate customers — had year-over-year growth of 38% in local voice, 13% growth in IP and e-services, and double-digit improvements in provisioning times, billing accuracy and e-service metrics, Bernard adds.

Among equipment vendors, those in the DSL and IP markets are going to do well selling to RBOCs, analysts say. Broadband access and voice over IP (VoIP) are where these carriers will focus their spending and deployment as they look to stave off competitive threats to their access business and lower operational expenditures, respectively.

Total equipment purchases of VoIP gateways and softswitches are expected to increase sixfold between 2001 and 2006 to almost $12 billion, according to Frost & Sullivan.

Despite this and other encouraging signs, no one's uncorking any champagne just yet. ■

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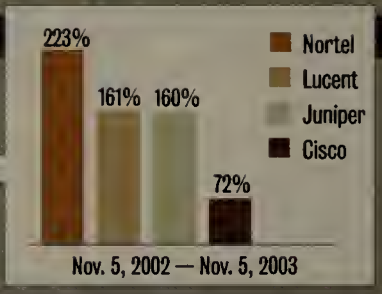
Mixed signals

Are these really signs of a telecom recovery?

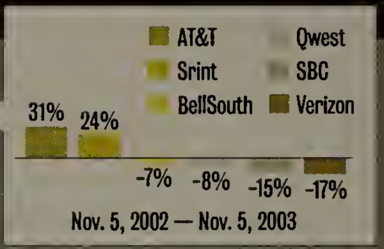
Positive

- Stock prices* of major equipment vendors have sky-rocketed over the past year.
- Carriers, chiefly MCI, are emerging from bankruptcy.
- Carriers are issuing lucrative RFPs.



Negative

- Stock prices* of RBOCs have fallen over the past year.
- Capital spending by North American service providers is off 21% from 2002.
- RBOCs say the regulatory environment discourages investment.



*Adjusted for splits and dividends.

Workplace

continued from page 14

for IBM/Lotus.

Just like rival Microsoft, IBM has promised to deliver a set of components that support the concept of contextual collaboration, which outlines how collaboration can be embedded in any application.

Microsoft recently released instant messaging and workspace features as part of Windows Server 2003, which along with Office, Exchange, SharePoint Portal Server and a hosted conferencing service are the heart of the company's collaboration plans.

"IBM is fulfilling a need in the marketplace for lightweight, low-cost components like messaging and IM," says Guy Mills, assistant vice president of information systems for Manulife Financial, a financial services group in Toronto. In July, Mills rolled out Workplace Messaging to 3,600 users in Japan. "When we looked nine months ago, Microsoft didn't have anything like this."

But Mills said he is a little skeptical of any all-encompassing integration plans. His concern right now is figuring out how to migrate more than 1,000 Notes-based applications to the new IBM platform.

IBM plans to add Workplace components and upgrade existing components every six months with the goal that by 2005 Workplace and Notes/Domino will have the same features.

Workplace Team Collaboration 1.1 blends synchronous and asynchronous communication by combining instant messaging/presence and team workspace. Workplace Collaborative Learning 1.1 is modeled on the IBM Lotus Learning Management System and supports the hosting of online classes and management of course material and student progress.

Upgrades to Workplace Messaging include support for personal calendars, and SuSE Linux 7.2 and 7.3 and IBM AIX 5.2. Workplace Web Content Management 1.1 now includes support for Oracle and Microsoft SQL Server databases. The component is priced at about $50,000 per CPU.

Pricing for the other 1.1 components is per seat. Workplace Messaging costs $29 Team Collaboration costs $89 and Collaborative Learning costs $35. ■

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Feds to push new set of security controls

■ **BY ELLEN MESSMER**

To bolster information systems security, the federal government is pushing to have civilian agencies, such as the Department of Agriculture, follow new regulations based on practices at the Department of Defense and Central Intelligence Agency.

The proposed regulations are laid out in a 238-page document, “Recommended Security Controls for Federal Information Systems,” issued by the National Institute of Standards and Technology (NIST) last week. The document details steps that civilian agencies must take to protect software, hardware and network resources, including physical security, personnel training and review, auditing and disaster recovery.

NIST wants agencies to start following the guidelines immediately, even though they are not expected to be finalized as a government IT standard for well over a year.

“This is far from an academic exercise; it's mandated by the Federal Information Security Management Act of 2002,” says Ron Ross, project leader at NIST. “With terrorism and the ability of our adversaries to attack our systems, this can't be an academic drill.”

The security guidelines are expected to push civilian agencies into unaccustomed practices, such as segmenting information assets into three main risk categories (low, moderate and high) and following proscribed procedures to protect them. A separate NIST document, “Standards for Security Categorization of Federal Information Systems,” describes how to do this, and it's expected to be an official standard, FIPS 199, by year-end.

The security-controls document issued last week is certain to be debated, because it imposes new restrictions and practices. It asks agencies to endorse a preference for vendor products tested under the so-called Common Criteria guidelines — something the Defense Department does today. While open source software would be allowed, it would have to be “assessed to determine the security impact of its use,” the report says. Shareware and freeware would be prohibited in many cases, as would the use of instant messaging on public networks or remote-access via dial-up. Voice over IP also comes under scrutiny in the regulations, which would disallow products that users could configure too easily.

In addition, agencies deemed to have moderate-risk information assets might have to buy new products, such as security gear to prevent denial-of-service attacks.

“Some agencies may say, ‘we have to do a lot of work,’” Ross says. “But it will start the dialogue. And we expect to learn a lot of things through the feedback.” NIST has deliberately left blank the specific requirements for high-risk systems until a public meeting is held next March at NIST.

While NIST's security benchmark is impressive in its detail, it's likely to be expensive for the federal agencies to implement, says Brad Johnson, vice president of consulting at SystemExperts. “But one of the most important things it will do is give people a common way to talk about the complex idea of security,” he adds. ■

Security crackdown

The National Institute for Standards and Technology last week issued proposed regulations for securing civilian agency resources.

When to be finalized?

Projected for fall 2005 as required FIPS 200 standard to be called “Minimum Security Controls for Federal Information Systems.”

What will rules affect?

Primarily non-defense civilian government agencies without national security systems; government contractors; and vendors supplying products to government.

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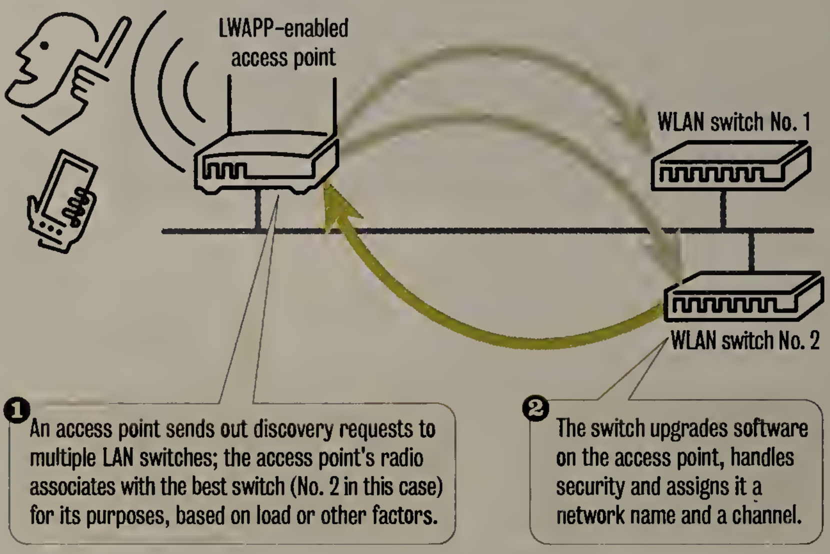
WLAN protocol hits standards trail

BY JOHN COX

Light touch

The Lightweight Access Point Protocol is an emerging standard for improving interoperability and communications between wireless LAN switches and streamlined access points. To date, WLAN switch vendors each use their own discovery or tunneling protocols.



① An access point sends out discovery requests to multiple LAN switches; the access point's radio associates with the best switch (No. 2 in this case) for its purposes, based on load or other factors.

② The switch upgrades software on the access point, handles security and assigns it a network name and a channel.

At the Internet Engineering Task Force meeting this week in Minneapolis, the standards group is expected to clear the last hurdles before launching work on a new wireless LAN protocol.

The group will review the latest draft for the Lightweight Access Point Protocol (LWAPP), which is intended to create a standard way for WLAN switches to communicate with streamlined radio access points. Proponents are convinced they have addressed a range of technical and editorial concerns that the IETF's Internet Engineering Steering Group raised in July.

If the Steering Group is satisfied, it seems likely the IETF will assign a working group responsible for crafting a document for formal consideration. It is anticipated that the working group will rename the protocol as Control and Provisioning of Wireless Access Points (CAPWAP), which is a succinct summary of what the protocol is intended to do.

A standard protocol, in theory, should let network executives mix different brands of access points and switches on their networks.

But it's unclear how important that actually will be to network executives, even if they're fans of the centralized WLAN security and administration that the emerging class of WLAN switches has made possible. One such supporter is Rene Lopez, manager of IT operations for Experience Music Project, a Seattle rock-and-roll museum who has evaulated WLAN products from several vendors.

"I've chosen a homogenous solution from [from Trapeze Networks]," Lopez says. "I'm not too concerned about buying different brands of access points."

But he wonders if existing protocols can fill the need for automatic discovery and provisioning.

Not surprisingly, the vendors backing the protocol say "no." Today, they use various discovery or tunneling protocols, either of their own making or by borrowing one, such as Generic Routing Encapsulation. In each case, the intent is to create a more or less automatic interaction between centralized switches and hundreds of relatively inexpensive access points that are little more than 802.11 radios.

Pat Calhoun, CTO for vendor Airespace, and one of the original LWAPP authors, acknowledges that the protocol mimics existing tunneling technologies, but does more. It also creates a standard framework for centrally configuring large numbers of access points, handling firmware upgrades and supporting session management, all secured by IEEE 802.1x authentication.

Even so, vendors are expected to quickly use CAPWAP — assuming it becomes an IETF standard — as a kind of lowest-common denominator. "It likely will be a base-level standard, with vendor-specific features added above that," says Michael Banic, vice president of marketing at Trapeze Networks, a WLAN switch vendor.

The rock museum's Lopez is puzzled as to why LWAPP is an IETF project rather than an IEEE one, the traditional domain of Layer 1 and 2 wireless networking. "Being the son of an IEEE member, I'd rather see LWAPP come out of there," Lopez says. "You may have to communicate over Layer 3, but the functionality is all at Layer 2."

Airespace's Calhoun says the IETF and IEEE coordinated unusually closely on this issue. The IEEE concluded, he says, that because LWAPP proposed no changes to the media access control or physical layers, which are the IEEE's keenest interest, the protocol development could be left to another group. "The IEEE is very comfortable with this," he says.

The Layer 3 component of LWAPP is a critical difference, says Michael Vakulenko, director of software engineering at WLAN switch vendor Legra Systems, and author of the Layer 3 section. "Layer 3 gives you flexibility, so you can put the switch in one building and have access points in other buildings," he says. "They can communicate over any network, as long as it talks IP."

Assuming no missteps, Calhoun says 18 months is a reasonable time frame for final IETF approval. But customers probably can expect to see early implementations from vendors before then. "You can't get things rubber-stamped in the IETF," he says. ■

VPNs

continued from page 7

made their moves, they affected users' decisions. Most of the likely customers wanted to see what Cisco would do before adopting SSL remote-access technology in their business networks, says Zeus Kerravala, an analyst with The Yankee Group, which surveyed network executives. "The mass market has been sitting on the sidelines waiting," he says. Now the wait is over.

But for all its clout, Cisco might have waited too long for some customers. Catholic Health Systems of Buffalo, N.Y., has installed SSL remote-access gear from Neoteris because distributing IPSec client software to PCs owned by doctors in private practice didn't work, says Doug Torre, director of networking and technical services for the healthcare provider.

When Cisco upgrades its VPN 3000s, the box that Catholic Health uses for site-to-site IPSec VPN links, the health organization will try out the SSL feature, Torre says, but will be skeptical.

"We will definitely try [the Cisco upgrade] to see what it can and can't do," Torre says. He is curious to see whether the Cisco gear handles all the Catholic Health applications that the Neoteris equipment can, and whether adding SSL will slow performance in handling IPSec traffic. "All-in-one boxes usually do not cut the mustard," he says.

Nortel Contivity customer Analog Devices has used Aventail SSL gear to grant business partners access to Analog Devices' network. The company will weigh the Nortel SSL capabilities because having both features on one device rather than two could simplify network architecture, says Ben Lasher, Analog's communications and computing services director.

Cisco has some catching up to put its products' features on par with those from other vendors, Conover says. For instance, the company says it still is working on the ability to wipe all traces of SSL transactions from remote machines so unauthorized users cannot reestablish connections. "They have 60% to 70% of what the competition has. It's not a 100% solution," he says, but that should come with later software upgrades.

Even competitors acknowledge that it's just a matter of time before Cisco becomes a force in this area. "You always worry about Cisco," says Evan Kaplan, CEO of Aventail. "Cisco is under no pressure to get it right the first time. Their distribution muscle, their account ownership, their capability . . . they're under no pressure. . . . They will get it right."

Senior Writter Phil Hochmuth contributed to this story.

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Avaya, Extreme unite on converged nets

Avaya to resell and support Extreme switches; companies plan to jointly develop technologies.

■ **BY PHIL HOCHMUTH**

Avaya and Extreme Networks last week said they are partnering to deliver customers a new option for building end-to-end converged IP networks and to develop management and other technologies needed to improve such environments.

The agreement, under which IP telephony vendor Avaya will resell and support Extreme's LAN switches, lets the companies gang up on Cisco, the leading supplier of LAN switching and IP telephony products.

Reselling Extreme's Black-Diamond, Alpine and Summit products strengthens Avaya's Ethernet switch offerings; its existing Cajun products account for less than 2% of the worldwide LAN switch market, according to IDC. Avaya has pulled back on development and marketing of its Cajun switches, though it will continue to sell them.

Avaya's share

Avaya will receive a warrant to purchase up to

2.6 million

shares of Extreme Networks' common stock, at a price of 1 cent apiece.

The deal also puts Avaya's $2 billion services arm to work for Extreme, giving it an army of 8,500 Avaya service professionals for installing and maintaining its Ethernet gear.

The two companies say they will work to co-develop technologies in the areas of management and provisioning, quality of service (QoS) and security for converged IP networks. Avaya and Extreme pointed to Session Initiation Protocol — an emerging convergence standard backed by Microsoft — as a technology they will focus on in joint product development efforts.

According to product managers from both firms, one technology being considered would let Extreme switches recognize Avaya IP phones and automatically configure QoS, security and virtual LAN settings for them. Other technologies could involve securing Avaya IP telephony gear with 802.1x technology running on Extreme's switch ASICs.

The firms say they also will work to meld their LAN and voice-over-IP (VoIP) management software platforms into a single application capable of provisioning and monitoring voice and data services.

Observers say the companies could find it challenging to work closely together given their different backgrounds.

"Extreme still has a West Coast start-up mentality, while Avaya is an East Coast company with roots in AT&T and Lucent," says Josh Johnson, an analyst with Synergy Research.

Zeus Kerravala, a Yankee Group analyst, says Extreme has the most to gain from the deal. "It's more likely that Extreme will have more success selling into Avaya's installed base" than vice versa, he says.

Avaya and Extreme are billing their combined product offerings as a standards-based alternative to "proprietary" convergence products, namely Cisco's AVVID product line. Then again, Avaya uses proprietary protocols in its Multivantage VoIP products, as do most competitors. Some industry analysts and users consider Extreme a leader in Layer 3 and Gigabit Ethernet LAN switching, though its market share has slipped. ■

Digital asset management becomes a reality

Boston media outlet and the University of Michigan begin rolling out systems.

■ **BY JASON MESERVE**

BOSTON — Two high-profile users last week joined with Sun and IBM respectively to announce programs that promise to more quickly and efficiently manage networked media resources.

WGBH, a Boston public television and radio station that produces one-third of PBS' prime-time lineup, is partnering with Sun, Artesia and Sony to build a digital asset management system that handles the organization's vast stores of video, images and other related content.

The system combines video I/O and transformation hardware, disk and tape storage (including a Sony PetaSite tape system capable of storing 4,000 hours of video), and a meta data/search system for finding and retrieving bits of content. A working version of the system serves as both a test bed for WGBH and an iForce Solution Center for Sun customers to visit and test any implementations before buying. IForce is Sun's partner program.

WGBH's version of the digital asset management system still is being developed and integrated with the station's existing hardware mix. Currently, it stores graphics, text and other information used on the organization's Web site. Also the production team for the program "Frontline" has just begun using the system to store video of past shows. Currently five of 500 episodes have been converted and stored in the system.

"[Ultimately,] producers will get ready access to content created in the past, whether it was yesterday or a decade ago," says David Liroff, vice president and CTO at WGBH.

When fully implemented, the system will store video in its native format and smaller proxies — low-bit rate MPEG-4 videos — that can be streamed to a producer's desktop so he can preview clips for potential use in a show. Content also can be reused for Web sites (a growing distribution point for WGBH) or other delivery mediums.

JEFF DUNN

> **"[Ultimately,] producers will get ready access to content created in the past, whether it was yesterday or a decade ago."**
>
> **David Liroff**
> CTO, WGBH

Sun helped build the infrastructure that ties together the multiple vendor products. And WGBH, with a grant from the Corporation for Public Broadcast, developed its own metadata language called PB Core that is used to describe the content stored in the system. Tools from Artestia and Virage help collect and store the metadata.

All of the equipment in the iForce Center, including the $1 million worth of hardware, has been donated by the technology companies.

Big Blue steps up

A broader approach to digital asset management is being developed at the University of Michigan in Ann Arbor with help from IBM and Stellent where images, documents and videos from throughout the institution will be stored centrally. The university is piloting a system with six of its 19 schools and colleges where everything from instructional videos to art history images are stored and managed in a central repository.

For example, the business school is creating videos that explain basic corporate-finance concepts that students must watch before attending the first lecture. The School of Literature, Science and Art is planning to store information and images on its 400,000-piece collection in the system to make it more accessible to archivists, faculty and students.

"A few years ago, a group of people around campus were becoming aware of the great difficulties the entire university community has with rich media," says John Williams, associate director of the university's Media Union center, explaining the impetus for the undertaking.

IBM provides most of the hardware for the Digital Asset Management System (DAMS) and its Content Manager application, which connects the various servers. Stellent provides a media server that categorizes and allows third-party editing tools to access and edit the stored content. All the licensed materials are free until the system moves into a production environment, Williams says.

Williams says he hopes to have some DAMS applications in limited production and slowly rolling out to departments in the company. ■

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Qwest extends long-distance data service availability

■ BY JIM DUFFY

Qwest this week said it now can offer long-distance data and IP services, in addition to voice, to businesses and government agencies in most of its 14-state region.

Qwest already offers these services — which include dedicated Internet access, virtual network services, frame relay and ATM — in the 36 states outside of its region. Two states within its region, Montana and Arizona, receive switched long-distance voice from another carrier's facilities or have not yet been cleared to receive Qwest long-distance services.

Until now, the company offered a limited switched long-distance voice service to consumers and small businesses inside its region. This week's move opens up a $6 billion market opportunity to Qwest within its region, says Cliff Holtz, executive vice president of Qwest's business markets group.

Qwest two weeks ago announced its restated results for 2000 through 2002. The company said it would reevaluate its results for those periods after uncovering questionable accounting practices, including swaps of long-distance capacity. The Securities and Exchange Commission and the Department of Justice are investigating the carrier's accounting practices.

Qwest was precluded from offering long-distance on its own facilities until it completed its financial restatement.

Regional Bell operating companies have targeted the large-enterprise market for much of their future growth. As they receive long-distance approval within their regions and then nationwide, RBOCs have turned up long-distance voice, data and IP packages such as Verizon's Enterprise Advance, of which the carrier has more than 800 contracts since late last year.

"Offering long-distance everywhere significantly improves our ability to compete for large business customers who have locations across the nation," SBC Chairman Ed Whitacre said in a statement about SBC's recently announced third-quarter earnings.

Under the new Qwest offerings, customers can opt for the carrier's Total Advantage or Voice Advantage packages. Qwest Total Advantage lets businesses customize a package of local and long-distance voice and data services, and then receive cost savings based on total communications spending and term length.

Qwest Voice Advantage offers discounted long-distance rates, based on total monthly spending and term commitment, for customers interested only in voice services.

The services are offered now in Colorado, Idaho, Iowa, Minnesota, Nebraska, New Mexico, North Dakota, Oregon, South Dakota, Utah, Washington and Wyoming. Qwest expects to offer switched long-distance voice services over Qwest-owned facilities in Montana later this month.

The carrier expects to receive long-distance approval from the FCC in Arizona by year-end.

To initiate the new service, Qwest is offering a long-distance promotion. Business customers with at least six local service lines and committing to at least $500 per month in switched long-distance voice services will receive a per-minute rate of 4 cents.

Businesses committing to at least $1,000 per month in dedicated long-distance services receive a per-minute rate of 2 cents. Both offers have a one-year term. ■

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VMware points users toward utility computing

■ BY JENNIFER MEARS

With its Intel server farm growing relentlessly, news conglomerate Gannett turned to virtual server company VMware to put multiple virtual machines on single physical boxes.

Gannett deployed VMware's ESX Server software earlier this year and began migrating applications from dozens of Intel servers that were running at less than 15% utilization to virtual machines on two four-way systems. Eric Kuzmack, IT architect at Gannett in Silver Spring, Md., says it's too early to tell what kind of utilization rates he will see, but he expects to be able to run between 15 and 25 virtual machines on the four-processor servers.

By deploying ESX Server, Gannett eliminated many of the headaches associated with managing dozens of one- and two-processor servers, but it did little to deal with management issues related to operating systems and applications. That's because with ESX Server, users have to log on to each host server and manage each virtual machine individually.

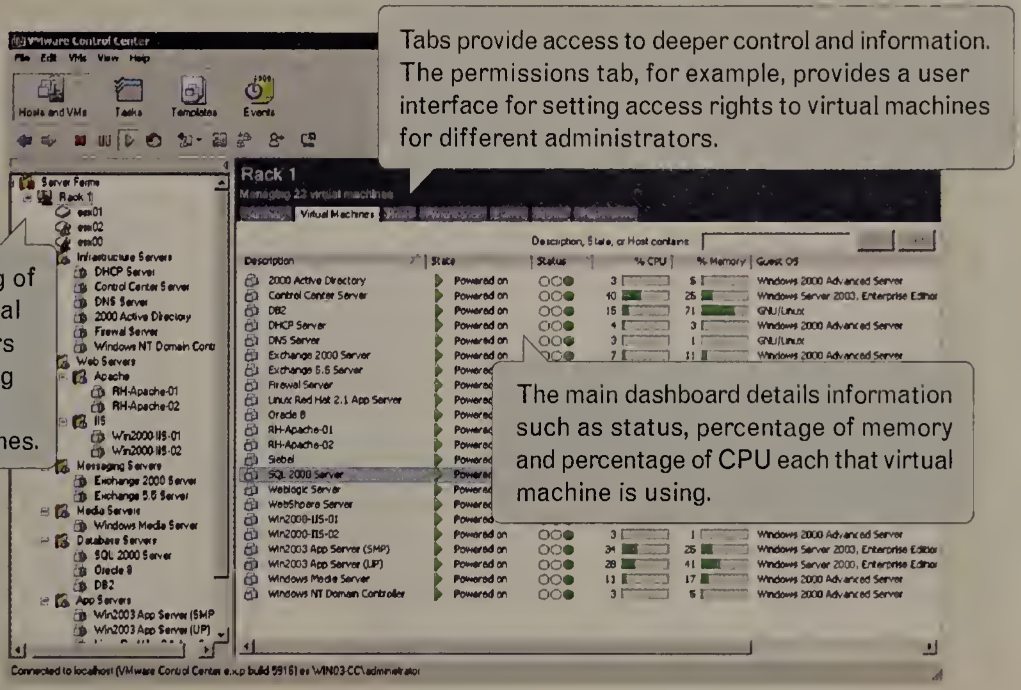
That's where VMware's new Virtual Center comes in. Announced in June as Control Center, the software was in beta testing for most of the summer. It is slated to be generally available next week.

Virtual Center provides a single interface for managing virtual machines that run Windows, NetWare or Linux on multiple physical servers. With Virtual Center, users can do things such as provision multiple systems at once by creating configuration templates that can be copied and shared across multiple servers for quick deployment.

See VMware, page 24

Taking control

VMware's Virtual Center software lets users monitor and manage multiple virtual machines from one place.



Tabs provide access to deeper control and information. The permissions tab, for example, provides a user interface for setting access rights to virtual machines for different administrators.

Listing of physical servers running virtual machines.

The main dashboard details information such as status, percentage of memory and percentage of CPU each that virtual machine is using.

Description	State	Status	% CPU	% Memory	Guest OS
2000 Active Directory	Powered on	○○●	3	5	Windows 2000 Advanced Server
Control Center Server	Powered on	○○●	40	25	Windows Server 2003, Enterprise Editor
DB2	Powered on	○○●	15	71	GNU/Linux
DHCP Server	Powered on	○○●	4	3	Windows 2000 Advanced Server
DNS Server	Powered on	○○●	3	1	GNU/Linux
Exchange 2000 Server	Powered on	○○●	7	11	Windows 2000 Advanced Server
Exchange 5.5 Server	Powered				
Firewal Server	Powered				
Linux Red Hat 2.1 App Server	Powered				
Oracle 8	Powered				
RH-Apache-01	Powered				
RH-Apache-02	Powered				
Siebel	Powered				
SQL 2000 Server	Powered				
Weblogic Server	Powered				
WebSphere Server	Powered				
Win2000-IIS-01	Powered				
Win2000-IIS-02	Powered on	○○●	3	1	Windows 2000 Advanced Server
Win2003 App Server (SMP)	Powered on	○○●	34	25	Windows Server 2003, Enterprise Editor
Win2003 App Server (UP)	Powered on	○○●	28	41	Windows Server 2000, Enterprise Editor
Windows Media Server	Powered on	○○●	11	17	Windows 2000 Advanced Server
Windows NT Domain Controller	Powered on	○○●	3	5	Windows 2000 Advanced Server

Connected to localhost (VMware Control Center e.x.p build 5916) as WIN03-CC\administrator

Short Takes

■ **Red Hat** is dropping its free Linux product range and asking customers to migrate to its priced Enterprise Linux, the company said last week. Red Hat said it will end maintenance and support for Linux Versions 7.1 through 8.0 on Dec. 31, 2003, and for Version 9 on April 30, 2004. Red Hat Linux still can be downloaded free but the boxed versions that were on sale for between $39.95 and $149.95 are no longer available. No future versions will be developed, Red Hat said. The company is offering its users a choice between two upgrade paths — to the stable Enterprise Linux product, which starts at $179; or to its developer-oriented Fedora Project, which is available as a free download. The Enterprise Linux product comes in three versions: AS for large corporate environments, ES for smaller offices and WS for workstation/desktop use. Each of these products is offered in basic, standard and premium editions, depending on the level of support required. The basic edition of Enterprise Linux WS costs $179, while the premium edition of AS for IBM zSeries and S/390 costs $18,000, according to Red Hat.

Top Layer gear boosts app protection

■ BY TIM GREENE

Top Layer Networks is announcing a faster hardware platform for its application filtering software and the addition of protection against three application-layer attacks it didn't defend against before.

Called Attack Mitigator IPS 5500, the new appliance adds protection against attacks on DNS, e-mail and file servers. Before, Top Layer appliances defended only against SYN flood attacks and HTTP worms, the company says.

The new device also supports 2G bit/sec throughput, up from 1G bit/sec on its earlier platforms, the company says. The box can be placed in-line with traffic as it enters a LAN from the Internet or as it enters a network segment containing valuable network resources such as mail servers and file servers, the company says.

Top Layer competes against ForeScout Technologies, KaVaDo, NetContinuum, Sanctum and Teros, whose gear falls into the application gateway appliance category. Some of these companies' products also perform other functions. NetContinuum's also terminates Secure Sockets Layer sessions and proxies traffic to and from servers to protect data about the servers from being transmitted over the Internet.

More attack protection

Top Layer's IPS 5500 adds filtering to combat application attacks.

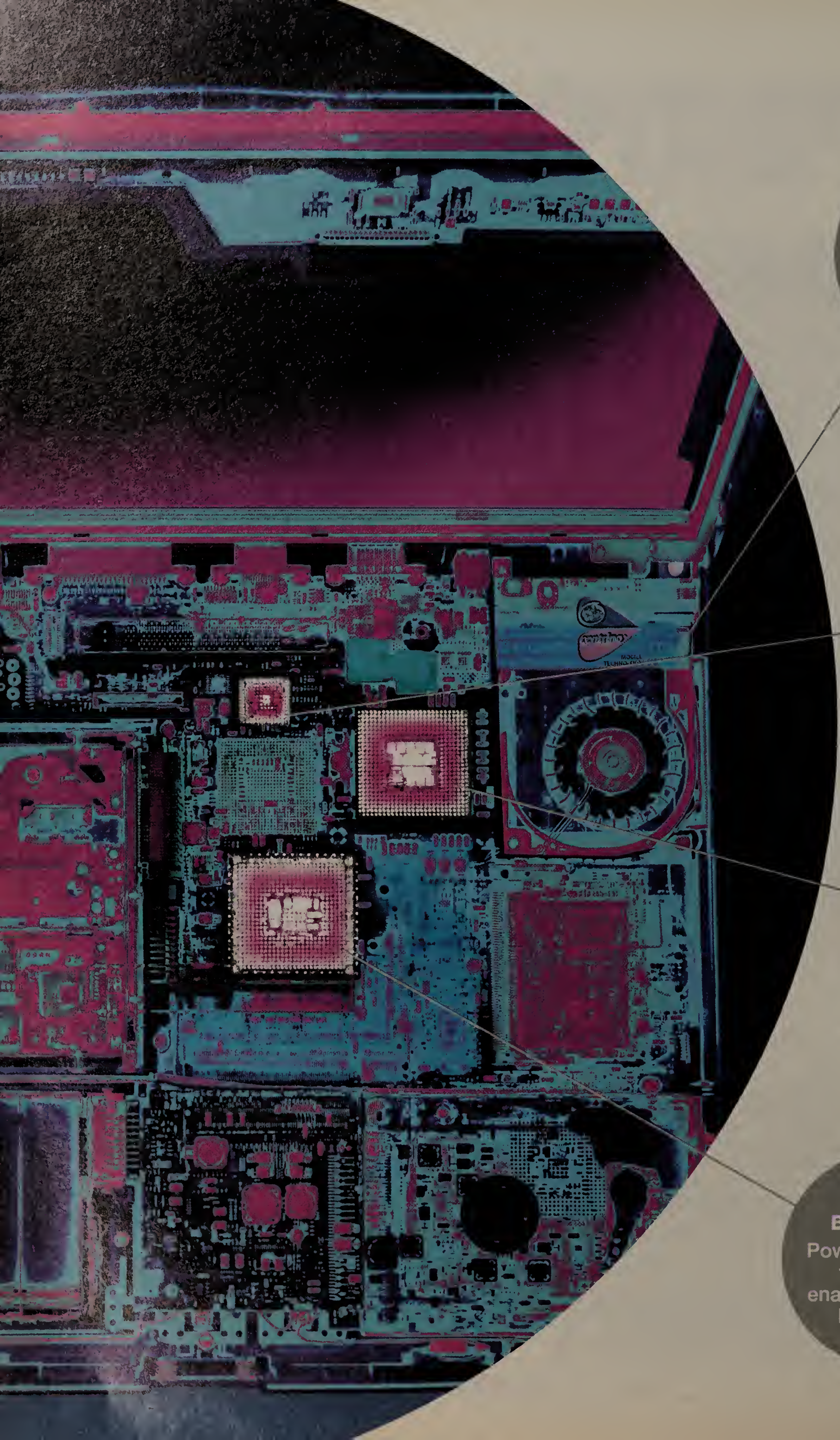
Equity trading firm Orbit II Partners in New York says it plans to beta test the IPS 5500 for its speed advantages over the current that Top Layer box Orbit uses, the IPS 100. The firm is using the equipment to protect its network from SYN floods and buffer-overflow attacks coming through its Internet connection. "It alleviates strain on our firewall," says Robert Newhouse, Orbit's CTO.

SYN flood attacks had been caught by the firewall before the company bought Top Layer gear, but dealing with the attacks ate up firewall memory and slowed performance, he says. Placing a Top Layer box between the firewall and the Internet weeds out such attacks before they hit the firewall, he says, and with its increased speed, the IPS 5500 should keep any delay to a minimum.

In addition, the IPS 5500 has an application programming interface that will let Orbit write custom policies to filter proprietary applications in Orbit's network, Newhouse says.

The beefed-up hardware will support future new protections against what Top Layer calls business logic exploits. These protections would scan traffic for legitimate-looking traffic attempting to perform forbidden transactions. So a user could set a rule banning use of XML for certain functions and block that traffic but let through XML traffic that perform approved transactions. Top Layer says it will use alliances with other vendors to support these business logic protections.

The IPS 5500 is set to be available in the first quarter of next year. Pricing has not been set. ■



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InSite: Lessons from leading users

Cancer center SAN ensures on-time treatment

■ BY DENI CONNOR

At the Cancer Therapy & Research Center in San Antonio, Texas, more than 200 patients each day receive radiation therapy on time because of an iSCSI storage-area network and some innovative remote boot technology.

Cancer Therapy & Research Center CTO Mike Luter says keeping critical components in his data center available at all times is key to the center's care offerings.

At CTRC, eight devices known as linear accelerators need to deliver radiation doses to CTRC patients every 10 minutes — one linear accelerator per patient.

Each accelerator communicates with a Windows NT server, which records and verifies radiation doses. The NT server, a critical part of the center's network, must stay up and running at all times so patients can get their treatment, says CTO Mike Luter.

Every minute counts

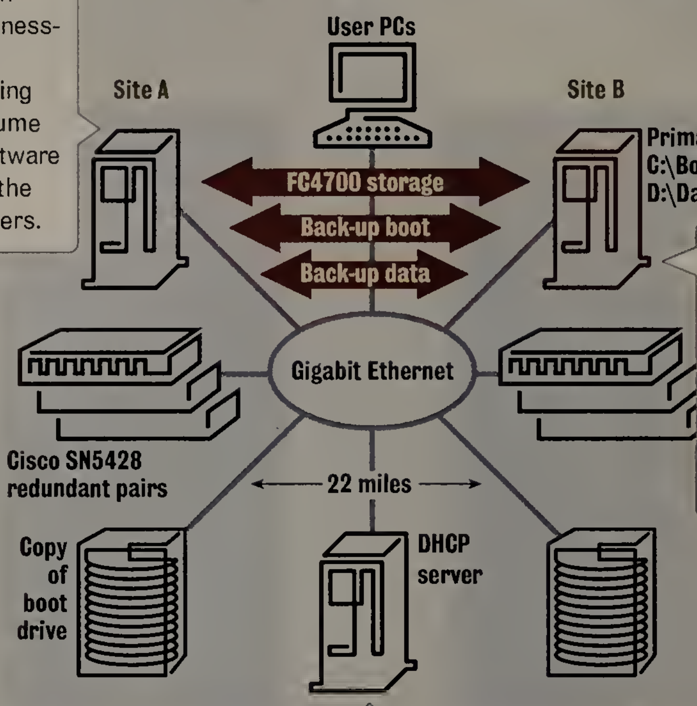
If the server is down for 10 minutes, as many as eight patients might miss life-saving radiation treatments. If a server is down for an hour while network managers rebuilds it, it can set the entire day off — 50 patients won't receive treatments.

In this installation, the server connects to a 3-terabyte EMC Clariion FC4700 disk subsystem, which stores the 100M-byte-sized patient treatment plan generated from the computed tomography imaging scans, magnetic resonance imaging and Positron emission tomography scans.

The FC4700 in turn links into to the Gigabit Ethernet network via dual Cisco SN5428 iSCSI storage routers. The Unix, Linux and Windows servers that run CTRC's diagnostic applications also connect to the Gigabit Ethernet network and access the data stored on the FC4700s via the iSCSI protocol.

Coming together

In an effort to quickly and les expensively link company SANs, the Cancer Therapy & Research Center is deploying iSCSI between its sites.



❶ CTRC replicates data between sites for business-continuity purposes using Veritas' Volume Manager software installed on the host computers.

❷ Using iSCSI's remote boot capability, CTRC can rebuild servers within 10 minutes if the server fails.

❸ When a server fails, the back-up server looks to the Dynamic Host Configuration Protocol server, which tells it where the drive for the failed server is located. In this case, the boot data and server data are located on the EMC FC4700 disk array at Site B.

The boot

To keep the server that records and verifies radiation doses up and running, Luter uses software called the Cisco Network Boot, which allows a spare server to load the operating system and initialization processes and step in for the other server if it fails.

Network Boot allows CTRC to put the contents of the server's system drive, or "booting function," on the FC4700 instead of the hard disk of the server, so when a server fails, boot information and data is not lost.

"All I need to do now is go to the [Dynamic Host Configuration Protocol] server, which has the [media access control] address of that record and verify server, change the address to that of the spare server, boot it, and now it's the record and verify server," Luter says.

Using Network Boot serves as an alternative to provisioning another server and lets Luter quickly replace a failed server, so treatments are not held up.

The data on the FC4700 disk array is mirrored using Veritas Software's Volume Manager for disaster-recovery purposes to a location 22 miles away, where Luter has another FC4700 subsystem and redundant SN5428 storage routers installed.

Fibre Channel costs

Initially, Luter planned to link the two SANs with Fibre Channel. He soon found that the cost of the Fibre Channel link was prohibitive and instead decided to adopt iSCSI. Observers have said that mirroring data using Fibre Channel over IP can cost as much as $2,000 per month, per mile.

"Our clinics and our research park are 22 miles apart," Luter says. "Its hard to run Fibre Channel 22 miles, even with SAN extension.

"We already had Gigabit Ethernet between the two sites so we could share the connection among voice over IP, applications and the iSCSI mirroring," he adds. "I didn't have to buy another circuit and didn't have to put expensive Fibre Channel adapters in my servers to accomplish it."

Luter's existing IT staff is in charge of maintaining the iSCSI network. ■

VMware

continued from page 21

In addition, IT administrators can create a virtual pool of resources out of all their servers with Virtual Center and a technology called VMotion, which the company says moves operating applications from one physical server to another without disruption.

Virtual Center and VMotion technology are key parts of the company's focus on virtual infrastructure, an effort to separate software and operating systems from server, storage and network hardware to enable the provisioning of software workloads based on resource demands.

It's an idea that Gannett's Kuzmack says he likes.

"Virtual Center gives us the ability to view the entire farm as a set of processor, memory and disk resources," he says. "When I hit a threshold I can either move my workloads around, add a new a host if I need to or add more disk."

Today, the migration of virtual machines must be done manually, and Kuzmack would like to see Virtual Center let him handle that automatically.

Michael Mullany, vice president of marketing at VMware, says a software developer's kit also is expected to be announced next week will enable that kind of automation by plugging into management tools such as IBM's ThinkDynamics or HP's OpenView.

Another feature of the VMotion technology is that servers can be taken down for maintenance without disruption, Kuzmack says.

Virtual Center also gives him the ability to delegate access rights to virtual machines for different administrators. The management software integrates with Active Directory to let him integrate security into server management, he says.

"It provides us the ability to granularly delegate authority over virtual machines, where in the past it was too complicated for us to do," he says.

A possible drawback of the VMware technology is that it creates a single point of failure: Should one physical server go down, all the virtual machines on that server go with it.

Mullany says Virtual Center and VMotion alleviate that problem because virtual machines can be migrated quickly from a problem server.

Pricing for Virtual Server is $5,000 for the management server and $300 for each management CPU agent. VMotion is an add-on to Virtual Center, and pricing was not immediately released. ■

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TOLLY ON TECHNOLOGY

Kevin Tolly

Over the top 'down under'

Try as I might, I just can't seem to get away from "the Microsoft question." In the midst of a September spell in Australia, I saw what to date has been the most over-the-top attack on Microsoft — characterizing the company, courtesy of its security bugs, as a danger to the government and citizens of Australia.

The story appeared in the Sept. 23 edition of *The Australian Financial Review,* a well-respected business daily.

The story focuses on a Bill Caelli. He is the head of the school of software engineering and data communications at Queensland University and described as a "strong critic of the [Australian] government's policy on computer security" — which he clearly deems unsatisfactory.

These quotes give you an idea where he is going: "It's about time the government stopped treating the IT industry with kid gloves." "The job of the government is maintaining the community security and safety. And that must extend to computer systems that control our critical infrastructure, and be necessitated by legislation. If not, the [cyber-attack] risk will simply become miles too high."

As I read this, I cringed. While things have to change in IT, I don't believe that government edict is the way to achieve that.

I couldn't help but think here was a 21st century Ralph Nader. In Nader's 1965 book, *Unsafe at any Speed* (www.nwfusion.com, DocFinder: 8433), he attacked the U.S. auto industry, charging that it was not looking out for the public safety. Government, he said, was the answer. And, the U.S. government responded with legislation that ultimately made driving in the U.S. safer.

But is this the way to solve IT problems? Caelli obviously thinks that it is.

The story says that "his plan" is to "force businesses to use secure ... computers," and not "cheap commodity software and computer systems."

For years, the U.S. government took this approach — viewing itself as special and requiring special versions of just about everything. This caused bloated budgets and made for some happy sales representatives in the various Federal Systems divisions of many technology vendors.

Fortunately, where possible the government has moved to using what it calls COTS (Commercial off-the-shelf systems) rather than specially written and priced systems.

This Australian movement would seem to be pushing to go back the other way — at a major cost to taxpayers.

But like it or not, change by edict does exert an influence. Just look at Japan.

A few years back, the Japanese government apparently mandated (I don't know the details) that certain internetworking devices needed to support IPv6 to be on the approved list for purchase. That was enough to motivate a number of vendors, and now IPv6 support is becoming more mainstream — at least for high-end, service-provider-class devices.

Will more government tinkering be the way to get Microsoft to deliver — or shut it out of certain markets? If what is happening down under takes hold, that's the way it could go.

Tolly is president of The Tolly Group, a strategic consulting and independent testing company in Boca Raton, Fla. He can be reached at ktolly@tolly.com.

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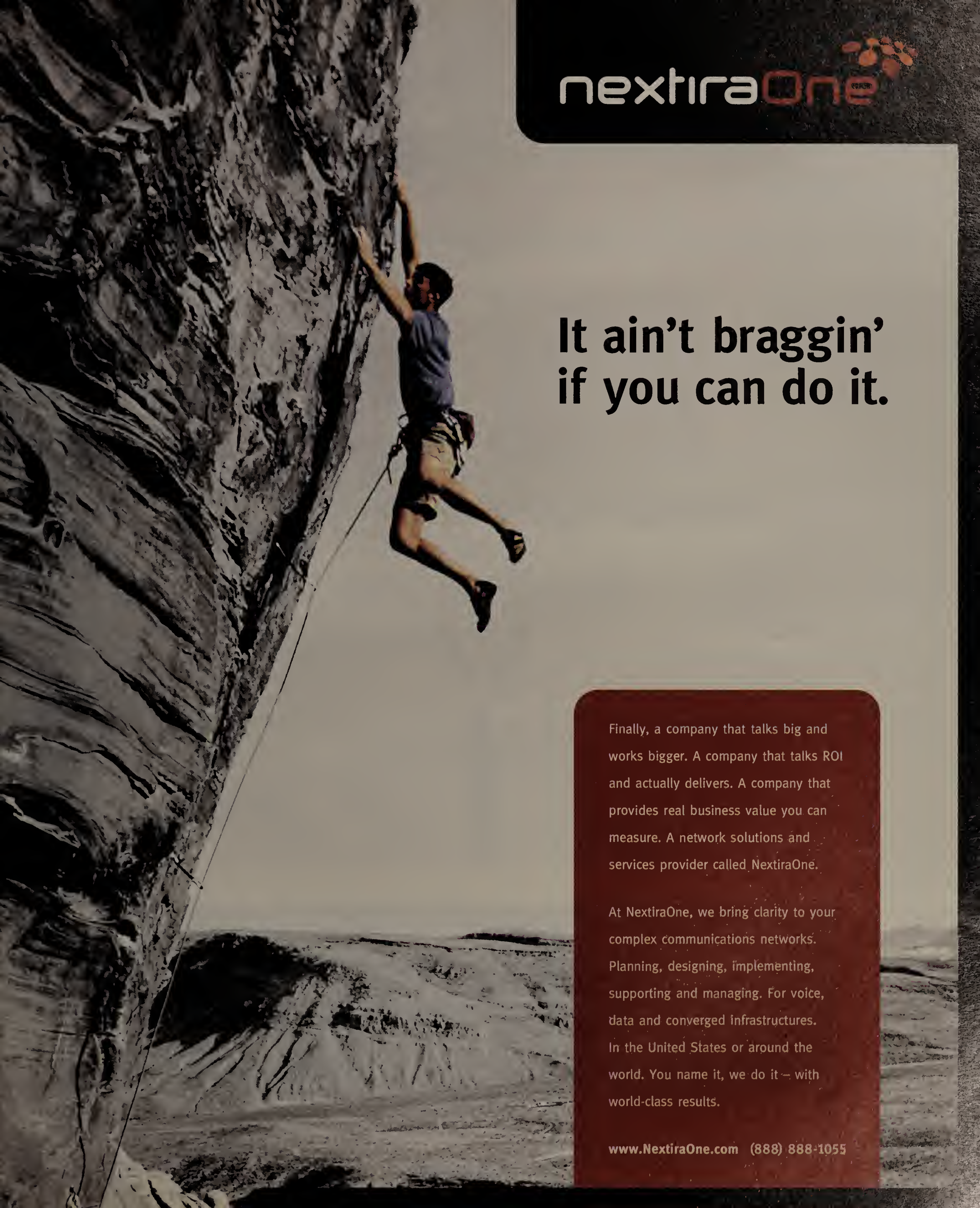

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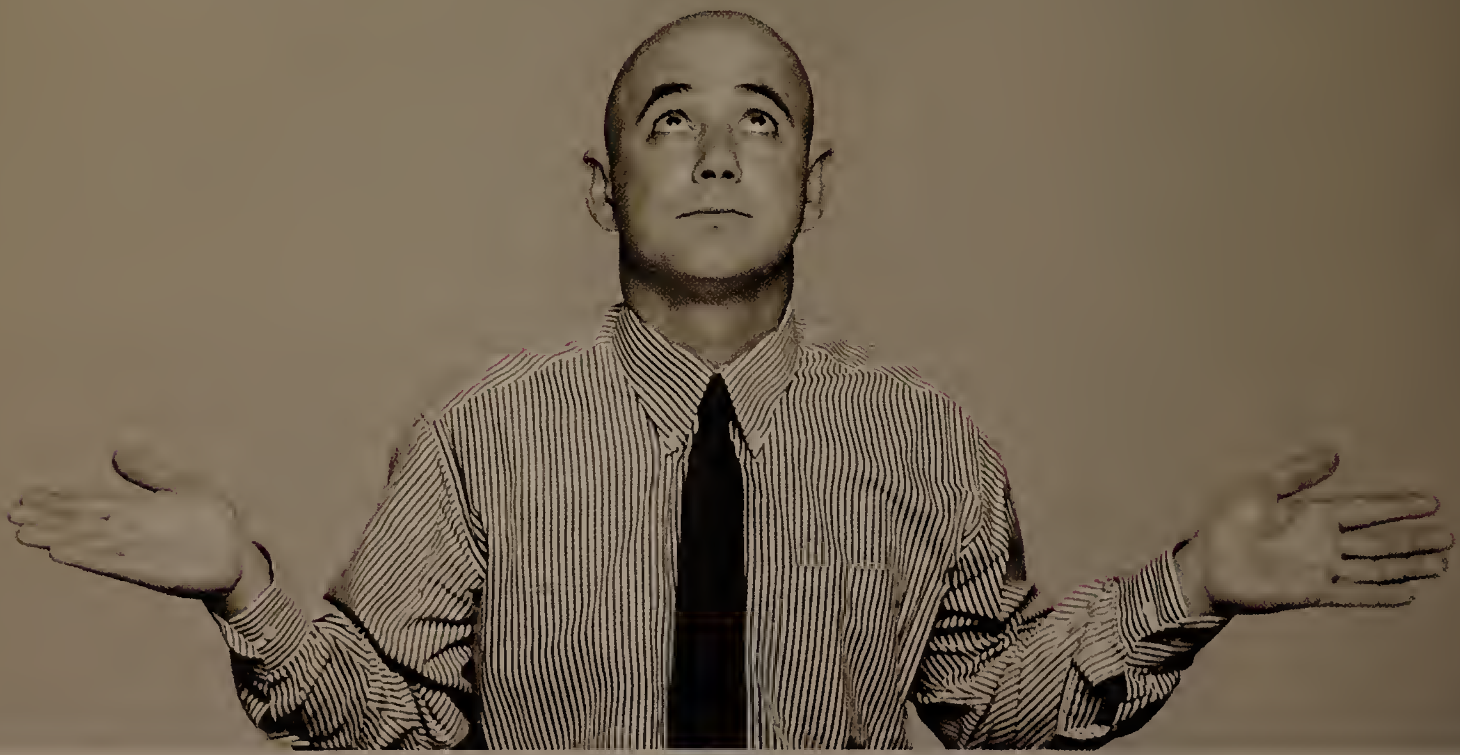

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Enterprise Applications

- PORTALS ■ MESSAGING/GROUPWARE
- E-COMMERCE ■ SECURITY
- MIDDLEWARE ■ DIRECTORIES
- NETWORK AND SYSTEMS MANAGEMENT
- WEB SERVICES

Short Takes

■ **Microsoft** last week released **Windows Rights Management Services,** an add-on to Windows Server 2003 that lets organizations add digital rights protection to information such as documents and e-mail. Windows RMS is the last of three parts that organizations will need to set and enforce rules on information usage. Users can restrict access, copying, forwarding and printing of documents and e-mails, for example.

Windows RMS is envisioned as a platform for enterprise digital rights management, meaning any software vendor can create applications to work with the technology. Microsoft says it is in talks with other software makers for expanded support of Windows RMS. For now though, the package works only with Outlook, Word, Excel and PowerPoint. Windows RMS costs $37 per client-access license. It runs only on Win Server 2003 Standard Edition, Datacenter Edition and Web Edition, Microsoft said. The Windows Rights Management Client is available as a free download.

■ E-mail software maker **Sendmail** is **partnering** with software company **Cloudmark** to provide integrated anti-spam features for companies using Sendmail e-mail products. Cloudmark's Authority enterprise anti-spam technology will be integrated with Sendmail message-transfer agents, giving Sendmail customers a plug-and-play, anti-spam technology. Sendmail, which also is available as open source software, is one of the most commonly used enterprise e-mail platforms. Cloud-mark's products use a Microsoft Outlook anti-spam plug-in called SpamNet to maintain a distributed, 700,000-person, peer-to-peer anti-spam network. Sendmail's decision to partner with Cloudmark comes after a number of similar announcements by other enterprise messaging and e-mail security companies.

Vendor brings Cobol apps to the Web

■ **BY JOHN FONTANA**

The theme for Web services is integration, and Micro Focus plans to bring Cobol into the picture by equipping companies with tools that convert the legacy code to align with the emerging technology.

Micro Focus last week released its Net Express with .Net, a tool that will let companies adapt Cobol running on mainframes to work with Microsoft's .Net Web services model. The conversion is designed to help companies reuse existing applications and potentially cut computing costs as more business transactions move to the Web.

Web and .Net services are designed to let business data and processes be shared over the Web between any number of applications built using standard protocols including XML and Simple Object Access Protocol.

"Some companies want to move the code off the mainframe because it makes sense from many perspectives, such as skills or licensing," says Ron Exler, director of research operations for Robert Frances Group. He says Cobol skills can be scarce and expensive. Hardware, software and licensing costs also can be factors in the decision that involves a total analysis of short- and long-term costs, and the flexibility to adapt to changing business needs.

"Micro Focus is offering a nice way to make connections between the legacy and the new technology worlds," Exler says.

Micro Focus' intent is not to put a wrapper around Cobol code so it can be hooked into Web services. Instead, Net Express with .Net compiles Cobol dialects, such as OS/VS Cobol and Cobol 2, into a language that can be read by Microsoft's Common Language Runtime, an environment where code is executed.

The Net Express tool integrates with Microsoft's Visual Studio.Net, which provides features to debug and test re-compiled Cobol code. The Net Express tools will allow the creation and consumption of XML documents from Cobol and use Cobol syntax to read and write XML documents.

The first release of Net Express is focused on batch applications, but Micro Focus plans to support other types of mainframe applications. The company will work with Computer Sciences Corp. and Electronic Data Systems to help companies move applications.

"We see that a services element will be important," says Ian Archbell, vice president of product management. The reason is that Net Express with .Net will not magically compile an entire Cobol application for .Net: Users will have to manually tweak various aspects of the code to convert the application.

Micro Focus has similar technology for Java 2 Platform Enterprise Edition, Unix and Linux. Other vendors such as Fujitsu and IBM also are developing tools to adapt Cobol for Web services.

Net Express with .Net is priced starting at $3,000 per seat. ■

Mostly mainframe

Upwards of

75%

of the world's business data is still processed on the mainframe, according to Gartner.

Mirapoint fattens up spam stoppers

■ **BY CARA GARRETSON**

Mirapoint is fortifying its e-mail security appliance with new anti-spam filters and administrator and end-user tools to help users manage unwanted e-mails.

The upgrades to Mirapoint Messaging Director's operating system offer companies 96% effectiveness in catching unwanted e-mails while maintaining a less than 1% occurrence of false positives, or messages mistakenly marked as spam, says Jeff Brainard, senior product marketing manager with the company.

The new anti-spam software, called Full-Spectrum and scheduled for release this month as part of Messaging Director Operating System Version 3.5, uses heuristic rules-based scanning that searches an incoming message's contents, header and attachments for telltale signs of spam, and assigns the message a rating based on that analysis. Network administrators can set thresholds — for example they can decide any message with a rating of 50 or higher should be identified as spam, Brainard says.

Once Full-Spectrum has determined a message is spam, network administrators can opt to have the message tagged by inserting the word "spam" at the beginning of the subject line, and store the message in a quarantined in-box or have it automatically deleted. Junk mailboxes are stored on the Mirapoint appliance, which users can check periodically. Users also can set up their own black and white lists, which define e-mail addresses that should always be blocked and never be blocked, respectively, Brainard says.

Mirapoint, which competes with other e-mail security appliance makers such as BorderWare and CipherTrust, says its appliance offers integrated spam and virus protection that companies can get up and running in less than 15 minutes, adding that it will require minimal maintenance.

"We're very decentralized, so we were looking for an all-in-one appliance . . . instead of having to integrate products," says Marc Palano, IT director with Illinois Tool Works, a manufacturing company with about 10,000 e-mail users that uses Mirapoint's appliance.

Illinois Tool Works has its business units around the world direct e-mail to the company's headquarters first, where Mirapoint's appliance checks it for spam and viruses and then forwards it back to the units over a VPN, Palano says. Of the hundreds of thousands of e-mails Full-Spectrum sifts through per day, about 50,000 spams are caught.

Messaging Director Operating System Version 3.5 is priced from $2.60 per user annually for companies with less than 5,000 users to $1.25 per user annually for organizations with 20,000 users or more. ■

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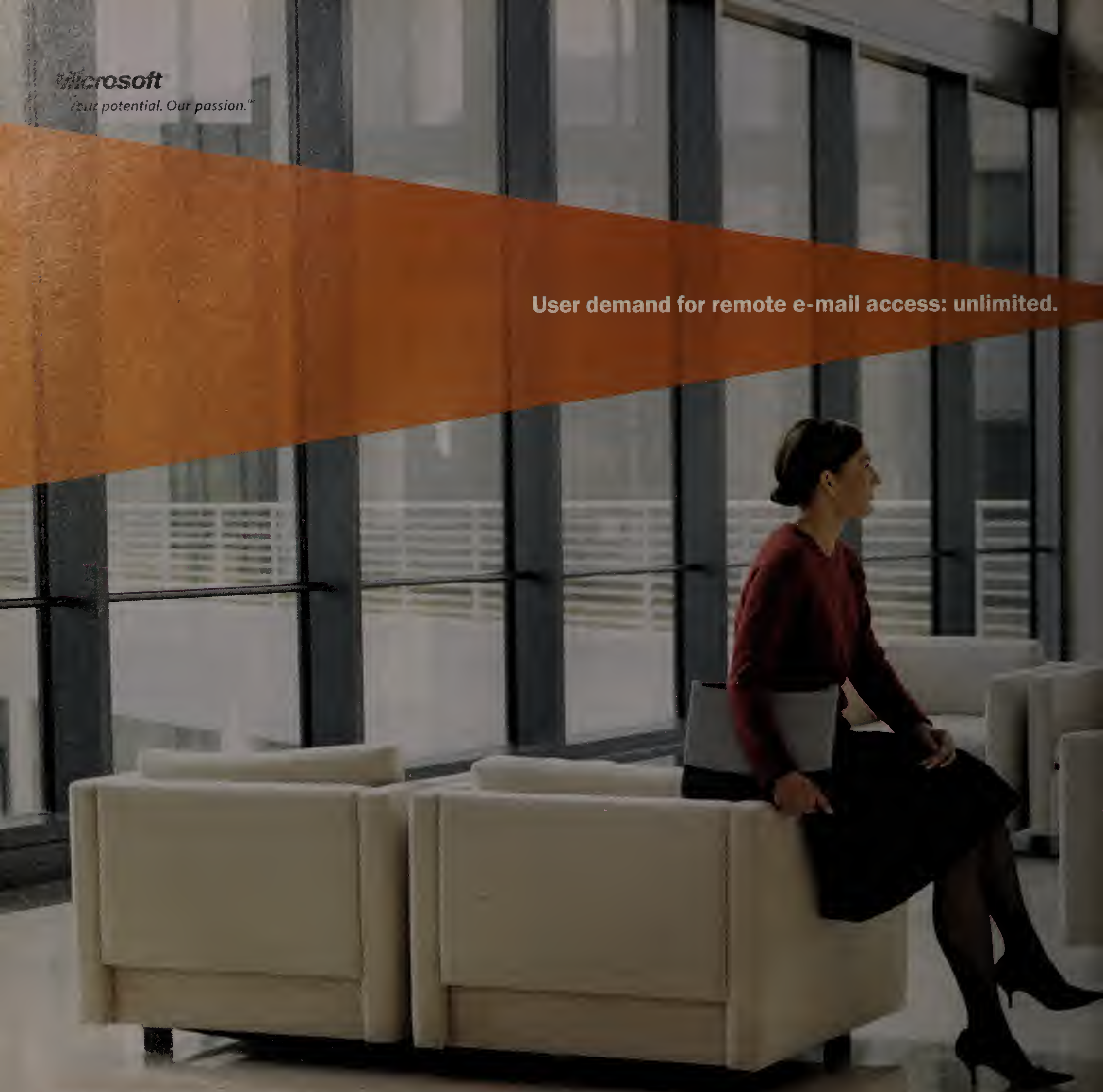
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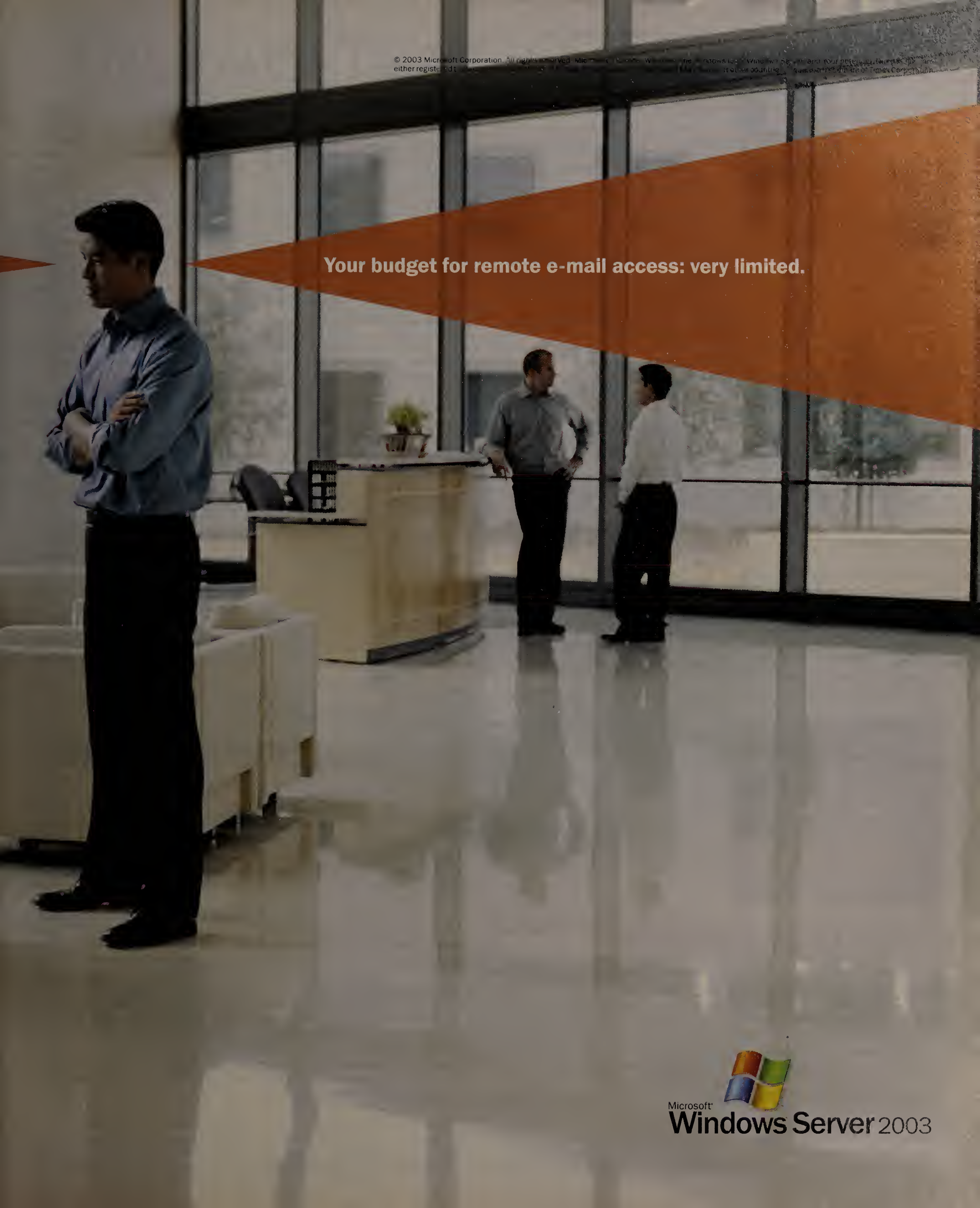
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'NET INSIDER

Scott Bradner

A different Big Mac index

Given my fondness for Apple computers you knew I would eventually write about the Virginia Tech Mac-based supercomputer-on-the-cheap. I was waiting for some of the testing to be completed. Because the test numbers are beginning to come in, I guess it's time.

This is one heck of a system — not the sort of thing that you would want in your den, but it looks quite useful for those into computational fluid dynamics.

To refresh your memory, Virginia Tech's Institute for Computational Science and Engineering (ICSE), already the home of more computing power than the average company, decided to try to join the ranks of the supercomputer elite. But the school wanted to do so with a total budget smaller than the annual power bill for the existing big guys.

After looking at various alternatives, including Advanced Micro Devices- and IBM-based systems, the school had just about given up when Apple announced the new dual 2-GHz G5 processor desktop last June. A few days later, after a trip to Apple headquarters to convince the company that the school was serious, Virginia Tech ordered 1,100 systems via Apple's online store. Apple started delivering the machines Sept. 5, and a small army of Virginia Tech students and teachers worked around the clock to install and interconnect the machines.

A month later they were testing what might turn out to be one of the five most-powerful supercomputers in the world. Virginia Tech spent $5.2 million on the Apple computers, Cisco Gigabit Ethernet and Mellanox InfiniBand switches, plus $2 million more on upgrading the building, installing a big Liebert UPS and a back-up generator. This is rather more than I spent on my last Apple PowerBook but a pittance compared with the $30 to $200 million that others have recently spent to join the same club (see www.nwfusion.com, DocFinder: 8434).

This shows that stock high-end Apple computers can be cost/performance competitive with the best that any other company can offer and that the OSX operating system can be used for advanced clustering applications with minimal special software. I would expect that the next generation of Apple's X-Servers would be even better for this sort of thing because they are much smaller, and more can fit in a rack. Also, because Virginia Tech will publish all the designs and (hopefully if the school can deal with the patent issues) all of the software used, I would expect to see a bunch of these Mac clusters popping up in research institutions and Fortune 100 companies soon. Pundits have called the Virginia Tech machine Big Mac, although this Big Mac has special but not secret sauce. It will be good fodder for Apple's and — because Apple uses IBM processor chips — IBM's marketing departments.

Economists use the Big Mac Index (Doc Finder: 8435) to compare prices in different countries. The Big Mac might do the same for those comparing the costs of high-end computing. If so, it will not be good news for companies building traditional supercomputers.

Disclaimer: Being from Harvard, I would hasten to add that low cost is not the whole story. But the above is my observation, not the university's.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached at sob@sobco.com.

Server enables offline access for Web apps

■ **BY ANN BEDNARZ**

Offline specialist BackWeb Technologies this week is expected to announce a retooled and renamed version of its flagship software for making Web applications available to disconnected remote and mobile workers.

BackWeb's Offline Access Server is designed to let companies offline-enable any Web application simply by tagging specific HTML pages, forms and documents for delivery. No application rewrite is required, says BackWeb CEO Eli Barkat.

Mobile population growth

The number of U.S. mobile workers will increase from 92 million in 2002 to

105 million

in 2006, according to IDC.

The product's successor, ProactivePortal Server, focused on Web-enabling portals and intranets. The new product extends the tools to Web-based business applications, such as CRM and ERP software, created with standard Java components or in a .Net framework.

The decision to move beyond portals makes sense, analysts say. BackWeb is betting that enterprise portals won't wipe out all other Web interfaces in corporations — and the company is right, says Nate Root, senior analyst at Forrester Research.

While portals, in theory, provide one central user interface with access to all of a firm's content, applications and processes, "the reality is never so neat and clean," Root says. "Portals take time to develop, firms merge, IT constantly buys new software — all of these regular business events create an ongoing need for stand-alone Web and thick-client interfaces for business applications."

The offline capabilities that some vendors build into their products often limit functionality. "Applications like CRM and ERP are notoriously hard to bring offline because they rely on such large, central data repositories," Root says. "Without replicating the entire data store to a local device, you can't ever create a 100% fully functional offline version."

Offline Access Server provides a consistent way to offline-enable multiple business applications, rather than maintain separate product-specific access tools, Barkat says. It includes a new, Eclipse-based development environment, called BackWeb Developer Studio, which lets Web developers build, test and deploy offline capabilities without changing the way an application works or modifying its code.

BackWeb's synchronization technology is designed to minimize network loads. Offline Access Server automatically updates content when a user's network connection is idle and can resume interrupted downloads at the point where they stopped. Pre-emptive download features let high-priority content bypass low-priority content.

BackWeb competes with vendors such as Covigo, iOra and Cysive, which also specialize in providing mobile and offline application access.

Among the challenges BackWeb faces is its small size, although it has had some success partnering with larger vendors, says Gene Phifer, a vice president at Gartner. For example, IBM and SAP resell BackWeb's ProactivePortal Server product.

The company eventually will have to contend with the rich-client strategies of vendors such as IBM and Microsoft, Phifer says.

BackWeb needs to keep an eye on Microsoft, Root agrees. Microsoft has announced broad offline synchronization capabilities due out over the next three years in its Yukon, Longhorn and Whidbey versions of its SQL Server, desktop operating system and Visual Studio.Net products. "The next-generation Windows clients and servers will have native synchronization features built in at the file-system level, so the market for vendors like BackWeb and iOra becomes less clear after 2006," he says. ■

Start-up takes aim at document management

■ **BY ANN BEDNARZ**

Start-up PSS Systems last week unveiled its first product: software aimed at helping companies track and secure documents that are distributed inside and outside of corporate boundaries.

PSS1 is designed to replace manual and ad hoc record management and retention procedures. The software lets companies centrally create, manage and enforce a range of policies for all documents, including copies on partner systems, home PCs, and removable or back-up media.

Having centrally managed rules takes the onus off individual users to know and implement policies, says Gary Kinghorn, director of marketing at PSS. With PSS1, companies can retroactively apply policy changes to existing documents. Auditing capabilities let users track events, such as unauthorized attempts to access a document or record policy changes.

The product sits on a central server that acts as a hub for centralized policy definition, including user and group definitions. Local servers act as a data cache for policy rules, keys, certificates and user information; these servers also support client applications that handle individual document transactions. Access control policies are attached to individual electronic documents — and travel with those documents.

Companies can integrate PSS with an existing Lightweight Directory Access Protocol-compliant corporate directory or Microsoft Active Directory to simplify managing users' privileges, Kinghorn says.

PSS competes with conventional content management vendors such as Documentum and FileNet. It also will compete with infrastructure vendors such as IBM, which recently introduced bundles of hardware, software and services for helping companies comply with regulatory requirements for data archival, retrieval and disposal.

PSS is focused initially on companies with high document sensitivity and regulatory compliance requirements, such as those in government, financial services, insurance and life sciences industries. PSS1 costs about $40,000 for 100 users. ■

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ServiceProviders

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Carriers brace for number portability

■ **BY DENISE PAPPALARDO**

The nation's largest wireless service providers are scrambling behind the scenes to ensure that systems for providing wireless number portability are up and running by the government's Nov. 24 deadline.

According to a report released last week by consulting firm Mobile Competency, service providers are not as ready as perhaps they should be.

"None of the wireless service providers have finalized intercarrier [service-level agreements] with all five of the other national providers," says Bob Egan, president of Mobile Competency. These agreements are critical in the success of ubiquitous number porting between carriers, he says.

T-Mobile disputes this point and says it has finalized agreements with five of the largest providers, but it still is testing its systems like its competitors.

Once the providers finalize SLAs they then have to test porting based on these agreements, Egan says. "Carrier networks need to be 99.999% reliable to successfully support porting." Based on the amount of work that still needs to get done, the carriers aren't close, he says.

"Here is an industry, by its own lack of readiness, is heading toward disaster," Egan says. He says a salesperson who depends on their wireless phone cannot afford to have it go dead for several hours as their number is ported.

This is why SLAs are critical, Egan says. Verizon Wireless says without such agreements other service providers could try to hold up porting requests. "The FCC is not requiring agreements between carriers, but from a practical perspective they are necessary," says Tony Melone, vice president of network operations at Verizon Wireless.

These SLAs, which for example Verizon Wireless has with T-Mobile, Nextel and Sprint PCS, spell out how porting requests are validated, pass through a third-party database and are completed.

"We were looking for more guidance from the FCC on this matter," he says. But as it stands today it's up to individual carriers to agree on porting requirements, such as mandating five customer facts are necessary to validate a porting request. The five information bits could be name, address, Social Security number, home phone and

See Portability, page 36

Nov. 24th deadline looms

Is your wireless provider ready to port your phone number to another carrier?

Criteria	AT&T Wireless	Cingular Wireless	Nextel	Sprint PCS	T-Mobile	Verizon Wireless
Porting call center	Yes	Yes	Yes	Yes	Yes	Yes
Dedicated center for business users	No	Yes	Yes	Yes	No	Yes
Published WNP guidelines	No	No	Yes	Yes	No	No
Anti-slamming measures	Yes	Yes	Yes	Yes	Yes	Yes
Finalized carrier SLAs*	No	No	No	No	No	No
User SLAs	No	No	No	No	No	No
Prepared for wireless to wireline porting	No	No	Yes	No	No	Yes

*With the other five largest wireless service providers.

SOURCE: MOBILE COMPETENCY

Juniper tries to grab edge from Cisco

■ **BY JIM DUFFY**

Juniper last week unveiled two edge routers designed to unseat older routers from rival Cisco that are already installed in service provider networks.

The M7i and M10i routing platforms are targeted at small and midsize points of presence (POP), campus networks and managed services environments that might be straining the performance and feature limits of Cisco's 7200- and 7500-series systems. Juniper says the new routers let service providers turn up any feature or service without compromising performance — and the company contends the Cisco routers can't offer the same.

At four slots and two rack units, the M7i chassis is Juniper's most compact M-series router. It features integrated ASIC-based J-Protect security, which includes network address translation, Stateful Firewall, IP Security and J-Flow accounting.

The platform comes with a choice of two fixed Fast Ethernet interfaces or one fixed Gigabit Ethernet interface. The M7i can serve as a provider edge router in small POPs, and a customer premises equipment system for managed services and campus border router applications.

The M7i supports 16 million packet/sec performance, even with features such as IP/Multi-protocol Label Switching (MPLS) Provider Edge capabilities turned on, Juniper says. The company says Cisco's 7200 and 7300 platforms only forward 1 million to 3 million packet/sec with a reduced set of features. Cisco declined comment.

The M10i is Juniper's most compact platform. The eight-slot, 5U chassis features fully redundant routing engines, forwarding boards, power and cooling.

The M10i is targeted at the installed base of Cisco 7500s, which forward a maximum of 2 million packet/sec, Juniper says. But when certain features are turned on, service to other users is degraded.

Cisco's upgrade to the 7500 — the 7600 Optical Services Router — also suffers from a service/performance compromise, and is missing some key MPLS Provider Edge functions.

The company also says service providers mixing Cisco and Juniper routers in their networks is common, despite the apparent inconsistency and incompatibility of features between Juniper's Junos operating system and Cisco's IOS.

"It's very realistic" that service providers will yank out their 7200s and 7500s for the new Juniper routers, even though the rest of their infrastructure is Cisco-based, says Mike Capuano, senior manager for portfolio marketing at Juniper. "It's happening all the time. We're in a lot of mixed networks."

One analyst disagreed.

"It's not a common occurrence" for service providers to replace Cisco routers with Juniper platforms, says Ray Mota, analyst with Synergy Research. "To just go out there and rip them out . . . that will be a tough sell."

Mota says service providers looking for a raw bandwidth boost might be inclined to evaluate the Juniper routers as replacements for the Cisco platforms. But the edge is where feature-rich services are defined and tuned. It's also where service providers make their money, he notes.

So it's unlikely that service providers will tinker with service consistency for the sake of a boost in raw throughput.

Both Juniper platforms support Physical Interface Cards from Juniper's older M5 and M10 routers. List prices start at $15,000 for the M7i and $25,000 for the M10i. ■

Short Takes

■ **Akamai** is enhancing the management tools it makes available to customers moving content and applications on its overlay network of 14,000 edge servers in 1,100 networks around the world. This week Akamai is expected to announce **EdgeControl,** a management tool suite it introduced in the summer to give customers the same control and access to data as they have on their private networks, will integrate with systems such as HP OpenView and IBM's Tivoli Netview. As a result, customers can integrate real-time monitoring and alert information directly into their existing management tools.

■ **Jamcracker,** which launched in 2000 as an application service provider aggregator, plans this week to introduce an identity management software suite for companies to deploy behind their firewalls. Called **Pivot Path,** the suite is an enhancement of the **Jamcracker Enterprise** product the company unveiled last year to give customers access to the integration platform it uses to manage the delivery of many hosted applications. A two-CPU license starts at about $45,000.

EYE ON THE CARRIERS

Johna Till Johnson

Carriers need a dose of 'buyer beware'

The long-anticipated court approval of MCI's emergence from bankruptcy came through on Oct. 31, leaving the company leaner, meaner and 85% lower in debt.

At almost the same time, BellSouth publicly spurned AT&T, ending years of takeover talks featuring more on-again off-again drama than J. Lo and Ben. The irreconcilable difference reportedly was a disagreement over AT&T's valuation, which BellSouth considered too high. Reports have it that BellSouth and other RBOCs (Verizon and SBC, in particular) are considering acquiring the newly spiffed-up MCI, presumably at more palatable valuations.

I'm not a huge fan of major telco mergers. More to the point, though, I think the folks who assess the value of telecom providers for Wall Street have their heads on backward.

Before I set about backing that up, full disclosure: I have close personal relationships with present and former employees at the aforementioned companies. And I have the greatest respect for their integrity and professionalism. So I'm not slanted toward one side or the other. But the facts are clear.

Start with MCI. The current company has almost nothing in common with its early-'90s namesake (which was a terrific firm). From an infrastructure perspective, the current MCI is a hodgepodge of entirely un-integrated networks, billing and operations support systems that continue to result in lousy customer satisfaction and higher-than-desired operational costs. Its business processes have never been effective (remember, I'm talking about the WorldCom-era MCI, not the lean, mean MCI of years back). And much of its former senior management team is under indictment.

Sure, it's got great branding, a shiny new group of executives and a virtually debt-free balance sheet. But folks, this is a company that has never functioned effectively in its current form. Any purchaser who plans to open this particular can of worms better pay close attention to the concept of "caveat emptor."

Now look at AT&T. Yes, the company came embarrassingly late to the Internet party, and former CEO Michael Armstrong publicly failed to execute on its most ambitious strategic decisions. And AT&T has suffered from some of the worst leadership in corporate history (remember the phone-book sales guy that was briefly anointed CEO?). But the company is sitting on a gold mine of assets: blue-chip customers, a world-class collection of intellectual property in its research labs, and a decades-long track record of delivering value to customers and shareholders.

Bottom line: If we're talking valuations, AT&T should be ranked as the stronger of the two. But it's a bad idea for either company to be involved in a merger right now. What AT&T needs is for someone like former IBM CEO Lou Gerstner to step up to show some outstanding leadership and leverage AT&T's assets to the fullest. And what MCI needs is time for CEO Michael Capellas and his crew to establish a new track record and demonstrate that the new company is a viable entity.

Johnson is president and chief research officer at Nemertes Research, an independent technology research firm. She can be reached at johna@nemertes.com.

Portability

continued from page 35

mobile phone numbers.

The fear is that if there isn't an SLA, a carrier that wants to hold up requests will say they need 20 pieces of information on a customer to validate a request, Melone says.

While most large wireless service providers indicated they are working toward carrier-wide SLAs, these agreements are one of the last steps in supporting wireless number portability. Several carriers indicated they've upgraded networks and customer support systems for the past two to three years to support porting.

These industrywide upgrades could cost as much as $1 billion, says the Cellular Telecommunications Industry Association.

"It has probably taken a lot more effort [to prepare for porting] than the general public realizes," says Rich Schmidt director of technology and product realization at Cingular Wireless. "We have been working on it in earnest since 2000 with preliminary work starting in '98."

Cingular estimates it will spend up to $237 million on porting by year-end and anticipates spending another $200 million next year to support the feature.

Cingular says it also deployed a new data architecture based on IBM gear. The system now lets the carrier provide new features from multimedia messaging to downloading ring tones. But Schmidt says that the upgrade was also needed to support porting.

The six largest providers also established new call centers to handle porting requests, questions and complaints.

But will the carriers be ready by Nov. 24?

"I can't guarantee that depending on volume that at first everything is going to be without flaws or adjustments," Cingular's Schmidt says.

Verizon Wireless says it has 95% of network testing complete. But Melone says one of the biggest challenges is to be sure that each carrier's system can talk and validate porting requests quickly.

With the ink barely dry on most intercarrier SLAs and testing still underway, Mobile Competency's Egan is recommending all users wait until the end of the first quarter of 2004 before they port their phone numbers. ■

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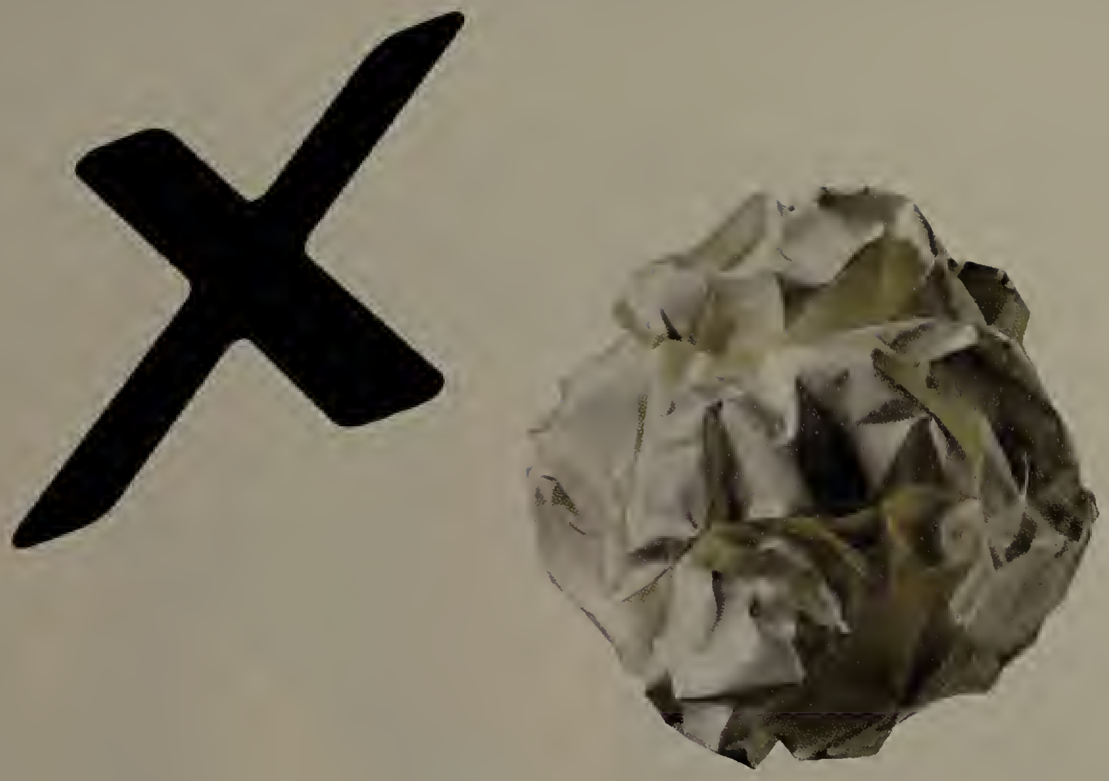

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Net.Worker

PRODUCTS, SERVICES AND STRATEGIES FOR TYING TELEWORKERS TO THE ENTERPRISE

Q&A Big ideas for advancing telework

Telework has come a long way, with many professionals routinely working away from the office. But can technology take it to the next level — get it to places that today can't support it? The Telework Consortium, a nonprofit organization charged with addressing the question, says it believes ubiquitous 100M bit/sec broadband and videoconferencing is the key. With its research, lab tests and technology trials, the group wants to profoundly change the way we work. John Starke, its president, recently spoke with Network World's *Net.Worker Managing Editor Toni Kistner about the group's strategy.*

What's your view of the current state of telework?

Telework is clearly stalled. . . .Now there are people who could be natural teleworkers if their business processes changed. For instance, there are a lot of people processing grants for the federal government who have to go into the office because the grants are all on paper. To get that class of people teleworking you have to get management's attention and shake them up. So we're starting with the argument — in this new research — that we're spending a lot of money on road construction when telework is a cheap alternative. We're making a major effort to get this report discussed by business people and politicians. Then the next issue is how do we take that from public cost to organizational cost. Because businesses won't change their processes for some abstract reason.

They don't want to pay for it.

But they might if they think they're going to get something for it. Our biggest task is educating management. This report isn't intended to just sit on a shelf. We're going to hit people over the head with it. The human resources argument hasn't worked. The increased productivity argument hasn't worked. Pollution and road congestion are too abstract to get businesses to change. We have to get senior executives to think they're going to affect their bottom line.

How can you get them to change business processes?

We're going to take this first study, then add a second that looks at the productivity of teleworkers who use average broadband — DSL and cable modems. We can demonstrate real performance increases for some classes of teleworkers, and also that sometimes jobs and people don't like to telework because they either need face-to-face time or the informal network to support them. Then we'll study whether providing them with higher-speed broadband and cost-effective video makes a difference. Not in the form of increased productivity, but in increased quality of decision making and faster decision-making times, which leads to faster time to market.

How does adding video equal faster time to market?

If you're trying to decide something really complex, it requires a lot of interchange of information. The biomedical field is a good example. The information isn't just a matter of listening or reading a paper — it's a matter of argument and understanding nuance. To the extent that you can get to a person who can expand your understanding of a problem quickly, get the nuance, exchange information, then get to somebody else quickly the same way, you're able to arrive at a decision to synthesize a complex idea faster. Now say you have somebody who's working on a new synthetic vaccine, where the expertise isn't located in one building or one state, but is scattered all over the country or the world. You can get on a plane and spend four days at a conference. Or instead, we can take that period of time and create 100 high-fidelity interactions with people; we could arrive at an understanding of the problem and solutions faster. We've looked at the quality of productivity cycle time cost, and it's exceeding our expectations. We'll soon be able to demonstrate that ultra high-speed broadband is affordable, and should be ubiquitous.

Aren't we're pretty far from that though?

I have 100M bit/sec wireless connection to my new house that costs me no more than a cable modem. The cost of bandwidth — it's a really confused market right now — and the technology isn't exactly shrink-wrapped from Best Buy yet. But looking at the trend in prices and computing power, we know we can solve the face-to-face problem virtually anywhere in the U.S.

How soon?

Lots of people who have been using good video for years, but they're on Internet 2. It fails the cost test. We're looking for technologies that work over the open Internet, so if you can get to it, you can have a face-to-face conversation with someone. Stuff you can buy at your corner computer store. We're not quite there but we expect to see solutions in two years, maybe a year.

What are the global implications?

We're moving to a new knowledge economy in which there won't be enough bright people with enough knowledge in any one place to have the kind of face-to-face collaboration we'll need. For us to remain competitive, we're going to need the communications infrastructure for the bright people to communicate with each other. Work is evolving, which will result in changes in real-estate values, land use patterns and enormous changes in the performance of the economy. And we want the U.S. to be the leader in this. ■

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Read the Telework Consortium's new research report.

DocFinder: 8436 and 8437

PROFILE: THE TELEWORK CONSORTIUM

Location: Herndon, Va.

Mission: To speed and expand the adoption of telework using videoconferencing equipment over ultra-high-broadband (100M bit/sec) connections. The group conducts research and evaluates products and best practices in its lab and in pilot programs.

News: The group's first published report, called "The Public Cost of Increased Commuting in Northern Virginia — An Economic Analysis of Highways, Metrorail, and Congestion Tolls," makes a case for telework by comparing the cost per commuter in taxpayer subsidies for roads, Metrorail and toll roads, with the cost of providing a household with broadband access.

Technology partners: 3M Worldwide, Agilquest, Alloptic, Comtech, Corning, Expertcity, Extreme Networks, Groove Networks, Meetrix, Microsoft, Nortel, Plethora Technology, Steelcase, Terabeam, VidiSolutions, Viseon.

Short Takes

■ **EMC, Novell, Time Warner Cable** and **Verizon** were among the 83 employers distinguished by the Environmental Protection Agency as New England's best workplaces for commuters. Cars and trucks account for more than half the region's ozone pollution, and the EPA's program highlights by region employers offering employees commuter benefits such as telework, metro passes, and carpooling. The EPA estimates that in 2000, 80% of the 6.5 million people who commuted to work in the region,did so in single-occupancy vehicles. To see how to qualify, go to www.bwc.gov.

■ **Netgear** recently teamed with software maker **Mediabolic** to develop home network entertainment gear. Netgear's first product will use Mediabolic's M1 Entertainment Operating Platform to stream audio between a stereo and networked PC via Ethernet cables or 802.11b wireless. The device is expected in December. Pricing has not been released.

TELEWORKER BEAT
Toni Kistner

A closer look at the Telework Consortium's efforts

The Telework Consortium is busy these days, compiling research reports, testing products and conducting pilots.

The group's first published report makes a business case for increased telework by highlighting the cost of government subsidies for northern Virginia highway and Metrorail expansion projects. For instance, for the I-66 Outside the Beltway project, which involves building new high-occupancy vehicle lanes, the report calculates the annual cost per commuter is $3,178. The point is twofold: We're spending a lot of taxpayer money on road construction, which alleviates congestion but increases vehicular emissions. It would cost a lot less to support a worker in a home office.

Think the answer is to shift more money to mass transit projects? The report also calculates the average annual subsidy cost per commuter trip for Metrorail is about $4,200, which doesn't count the cost of commuting to and from the station.

The report is trying to show the pillars of government and industry that tax money can be spent more efficiently while helping the environment — by subsidizing telework, not highways and railways.

Speaking of telework centers, the Consortium recently announced a telework pilot with the NetTech Center of Winchester, Va., one of several facilities sponsored by the General Services Administration. Located 72 miles west of Washington, D.C. Winchester sits at the crossroads between two fiber backbones. Residents and NetTech workers enjoy 6M bit/sec Internet connections, ideal for testing remote collaboration tools.

"For the pilot, we're seeking applicants who live in Winchester and can't telework, so we can see if these tools make it possible," says Linda Whitmer, director of the center. Whitmer says she hopes the technology will increase the number of days existing teleworkers actually telework.

She raves about desktop tools that provide real-time, multi-party video; voice and data collaboration; and telemedicine. Whitmer, who has multiple sclerosis, says the center is working with the University of Virginia to let her have her next neurological appointment from her desk.

"I won't have to take a day off or make the three-hour drive to Charlottesville," she says. "It takes a car off the road, and my husband doesn't have to drive me."

The Winchester center is 100% subsidized by the federal government; workers pay a monthly fee ($500 to $600) based on the center's operating costs. Today, the center is filled to only about 69% capacity with a mix of public and private sector teleworkers and small companies, but Whitmer is confident capacity will increase next year.

Telework centers are discounted by some, including the Environmental Protection Agency, as not "real" telework because workers must drive to an office. But John Starke, president of the Telework Consortium, says the telework center model is a good way to expand telework. Starke says the telework center model can shorten the commutes of those who must do their jobs in secure locations.

Starke is speaking of proximate commuting, where employees of multi-site firms work at the site closest to their homes.

"In Washington, there are more than 50 Justice Department buildings. It's likely that any one of its employees might be passing 10 on his way to work. So why not drive to the nearest one?" Starke says. ■

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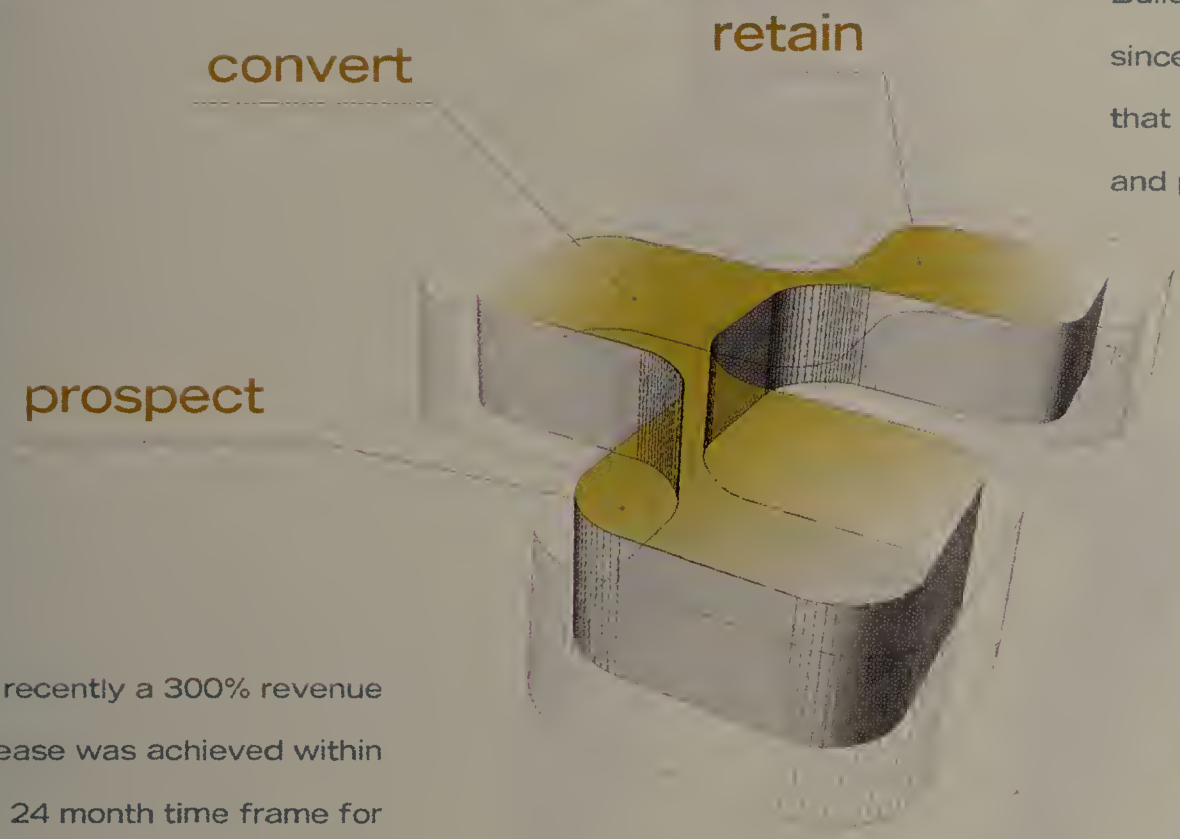

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Technology Update

■ AN INSIDE LOOK AT THE TECHNOLOGIES AND STANDARDS SHAPING YOUR NETWORK

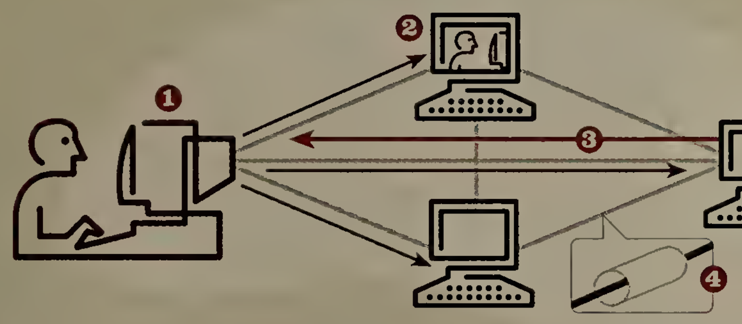
Wireless mesh networks boost reliability

■ **BY BOB JORDAN**

■ **HOW IT WORKS**

Wireless mesh networks

Smart, self-aware nodes automatically self-organize in this type of network topology.



❶ A new node joins the wireless mesh network using a simple, discovery protocol to multicast its presence to listeners on the network.

❷ Existing nodes recognize the new node and reconfigure and retune the network transparently to incorporate it.

❸ Each node frequently recomputes the best path, based on received signal strength, throughput, error rate and latency.

❹ In-band control messages and user traffic are secured inside encrypted tunnels.

Wireless networks have long embraced a centralized model that holds the potential for bottlenecks, latency and a single point of failure. But wireless mesh networks are emerging as an alternative to wireless switching. Mesh networks distribute intelligence from switches to access points by incorporating a grid-like topology.

The development of this topology parallels the architecture evolution in the computer industry. First, computing environments were stand-alone mainframes; these were followed by client/server and then peer-to-peer. Network architecture inevitably will evolve to a distributed, dynamic wireless architecture.

A mesh network allows nodes or access points to communicate with other nodes without being routed through a central switch point, eliminating centralized failure, and providing self-healing and self-organization. Although decisions on traffic are made locally, the system can be managed globally.

Wireless expansion

Today's wireless LAN mesh networks use standards-based 802.11a/b/g, but they can be extended to any radio-frequency technology, such as UltraWideband or 802.15.4 Zigbee. Because network intelligence is contained within each access point, no centralized switches are needed — just intelligent access points with network processors, switching capability and system software.

For a network to intercommunicate in a mesh topology, the nodes' self-discovery features first must determine whether they are to serve as access points for wireless devices, as backbones for traffic coming from another node, or a combination of roles.

Next, the individual nodes locate their neighbors using discovery query/response protocols. These network protocols must be parsimonious so they don't add much overhead to the traffic — that is, they cannot require more than 1% to 2% of available bandwidth.

Once the nodes recognize one another, they measure path information such as received signal strength, throughput, error rate and latency. These values must be communicated among the neighbor nodes, but this information must not take up very much bandwidth. Based on these signal values each node then selects the best path to its neighbors so the optimum quality of service is obtained at any given moment.

The network-discovery and path-selection processes run in the background, so that each node maintains a current list of neighbors and frequently recomputes the best path. If a node is taken off the network — for maintenance, rearrangements or failure — the adjacent nodes quickly can reconfigure their tables and recompute paths to maintain traffic flow when the network changes. This self-healing attribute, or failover, sets mesh topologies apart from hub-and-spoke networks.

The node knows

Each node is self-managed, yet is part of an organized network that can be managed and configured as a single entity from a centralized point. Using SNMP, a systems administrator can set and monitor individual elements, nodes, domains or an entire network. Discovery protocols simplify the task by seeking out and locating individual nodes for display on management screens.

Because mesh networks rely on management, control and discovery messages, they must be able to secure this traffic and user traffic. In-band messages, secured within encrypted tunnels, remain free from eavesdropping and similar attacks. Standards-based security techniques, such as 802.1x and Advanced Encryption Standard encryption, ensure that only authenticated wireless devices and nodes are in the connection and that they are properly encrypted.

It all begins to mesh

Mesh topology is inherently reliable and redundant, and can be expanded quickly. A wireless mesh network doesn't require elaborate planning and site mapping. Nodes can be up and running as soon as administrators mount them.

Administrators can fix the problem of a weak signal or dead zone by moving a wireless node or dropping another node into place. Networks can be deliberately over-designed for reliability by adding extra nodes; typical mesh networks can expand to hundreds or even thousands of nodes.

With intelligent points on the network dispersed, mesh networks can organize themselves, select the best path for user traffic, route around failures or congestion, and provide secure connections. The decentralization provides for unlimited growth and stability. Mesh architecture just might be the future of wireless networks.

Jordan is co-founder and vice president of marketing at Strix Systems. He can be reached at bob.jordan@strixsystems.com.

Ask Dr. Internet

By Steve Blass

I found a directory called sitebot with a readme file that referred to the software in the directory as an Eggdrop. This was under the Windows directory on a PC that claimed to have zero free space on an almost empty hard drive. What's an Eggdrop?

The Web site www.eggheads.org says Eggdrop is the world's most popular Internet Relay Chat (IRC) bot. According to www.egghelp.org, "An IRC bot is a program that sits in an IRC channel 24-7. It looks just like a normal user on the channel, but is usually idle until it's called on to perform a particular function." There are legitimate uses for IRC bots, but it sounds like you have been unknowingly hosting a file distribution site. The virtual file system used by some Eggdrop bots hides files from Windows directory listings, while the disk properties dialog usually will show a true picture of the space left on the disk. You might be able to see the files by booting into Linux from diskette. One source for a useful Linux boot diskette can be accessed via www.nwfusion.com, DocFinder: 8439. It might be difficult to manually remove all Eggdrop components from your system. Find the network vulnerability through which the software was installed on the PC and keep up with all security patches.

Blass is a network architect at Change@Work in Houston. He can be reached at drinternet@changeatwork.com.

GEARHEAD
INSIDE THE NETWORK MACHINE
Mark Gibbs

Real pleasure with virtual machines

Last week we started cleaning up our desk by reducing the number of keyboards and mice by using the two-port, ultra-compact Built-on-Cable KVM Switch from StarTech.com.

As we noted, some odd things happened, such as the keyboard suddenly appearing to have Caps Lock on or the PC being fooled into thinking that a text selection had begun. In the end we gave up on the BCKS because we got tired of clearing these peculiar conditions. Instead we tried the Switchman from Raritan.

The Switchman is functionally the same as the BCKS although it requires more desk real estate — it's not a cable harness like the BCKS, but a box to which all the cables connect, providing "soft" (keyboard key sequences) console switching as does the BCKS, plus physical switches that do the same things.

The Switchman comes in two- and four-port versions, optionally with cables, and it works flawlessly. Pricing starts at $100 with cables.

At the end of last's week's column we mentioned a product called VMware Workstation and our plans to use it to run Windows under Linux.

Well, we ran it up and, let's see, how could we describe this software? How about: Wow! Fantastic! Sensational! How did we ever live without it? Yep, it is that good, even though we hit a few rough spots at the get-go that had nothing to do with the product.

VMware creates one or more virtual PC environments in which you can run "guest systems" — Windows Server 2003, XP, 2000, NT 4.0, ME, 98, 95 and 3.1; MS-DOS 6; all Linux distributions (Red Hat, SuSE, and Mandrake); FreeBSD; Novell NetWare 6.0 and 5.1, or pretty much any other operating system that doesn't do anything bizarre with regard to hardware.

VMware emulates all the PC hardware, including the PCI and ISA buses, SCSI interface, video, floppy, CD and IDE drives, Ethernet interfaces (up to three per virtual machine), serial and parallel ports, USB interface, mouse, sound card and BIOS. It also supports virtual machines with dual-boot configurations.

The network support in VMware is interesting. You can select from four configurations: none at all; host-only networking, where only the host can be seen by the guest; bridged networking, where the host and the guest share a multiplexed Ethernet connection; or network address translation networking, which is the host-only option but on a private subnet that connects via a gateway to the host's interface.

Installing VMware under Linux is fairly straightforward, although we strongly recommend getting a copy of *The Book of VMware* by Brian Ward.

The book covers pretty much all the details of getting VMware running in a more accessible way than the VMware documentation, even though that documentation isn't that bad.

Installation under Linux can be done from a TAR archive or a Red Hat Package Manager (RPM) file. A TAR archive is created using the Unix TAR utility. This tool combines multiple files into one archive file. (You often will find these archives compressed with the gzip file compression tool, with the extension .tar.gz.). If you use a TAR archive version you simply unpack the contents (using, for example, the zcat utility under Linux) into a subdirectory and then run the VMware install script.

RPM is a sophisticated system for managing software installations — it will handle installing, erasing, upgrading, querying and verifying packages (see www.nwfusion.com, DocFinder:8432 for the best explanation of what RPM can do). Note, however that Red Hat's graphical version of RPM will not show packages other than those specifically included by Red Hat.

We used the RPM version of VMware, which didn't go as smoothly as we had hoped. We launched the RPM program, and for some reason it didn't run to completion.

Unfortunately as far as RPM was concerned, VMware was now installed and it wouldn't re-install it even though all the files were of zero length. Even more unfortunately, RPM refused to verify or erase the package for exactly the opposite reason: That VMware wasn't installed!

Just what we needed — another learning experience. Next week, we fix the problem without losing hair.

Soothing words to gearhead@gibbs.com.

Cool Tools
Quick takes on high-tech toys
By Keith Shaw

Home movies to DVD: An all-day affair

Got a handful of home movies on videotape that you want to put on DVD? Better have a week's vacation time ready.

I recently found this out when testing two new devices that aim to ease the transition from video to DVD. While the devices are easy to hook up and get running, the process of capturing the video and burning the DVD can be more painful than a three-tooth root canal.

The first device we tried was the HP DVD Movie Writer dc3000. The dc3000 is basically a DVD burner drive that has a bunch of audio/video ports on the outside of the case, and a USB interface that connects to your PC. When you connect a video source (VCR or camcorder) and pop in a tape, the software will do the rest, capturing the video and then burning it onto a DVD.

The second device, which pretty much does the same thing, is ADS Technologies' Instant DVD 2.0. The only difference is that it doesn't have a DVD burner, so you need to have a burner with your PC (we used Freecom's outstanding FX-50 external DVD-RW drive).

The problem with these systems is the video capture time. If you have two hours of home movies, it will take two hours just for the capture process. Then you have to add burning time, which also can last hours.

With the DVD Movie Writer, we were surprised to find out that the hardware didn't install properly, after an hourlong video capture. We reinstalled, then tried again, and burned our DVD. But we wished we could get our hour back.

The process was even more frustrating with the bundled software that ADS provides. This time, I attempted to transfer my 2.5-hour wedding video onto a DVD. Here's a quick diary of what happened:

HP's DVD Movie Writer, like AVD's Instant DVD, transfers home movies to DVD — very slowly.

10 a.m. — Begin the capture process.

12:30 p.m. — Capturing over. What a great wedding video!

12:45 p.m. — Realize that the file it created is 5.6G bytes and won't fit onto a 4.7G-byte disc. Begin editing video.

2 p.m. — Edits down to 4.7G bytes. Begin creating title screen and start burn process.

2:15 p.m. — Software tells me that a disc can hold only 4.4G bytes, despite the 4.7G-byte label on the disc.

2:16 p.m. — Consider throwing the PC, VCR and wedding video out the window. Realize that wife wouldn't like having the wedding video destroyed.

2:18 p.m. — Go back to the video editor and cut out the "I Will Survive" dance scene and the "Electric Slide" coverage.

2:30 p.m. — Start burning again with a 2-hour, 4.4G-byte file.

5:14 p.m. — Drive completes burning process and ejects disc.

5:16 p.m. — PC asks me if I want to play the video on the computer. Arrogantly, I say no, heading toward the regular DVD player instead.

5:18 p.m. — DVD player displays "Disc error! Please check disc" message. Aargh, an older player!

5:19 p.m. — Watch DVD on drive I burned it on.

I tried watching it on my Playstation 2 (which plays DVD movies) and other PCs that had a DVD drive, and it turns out I couldn't do that either. It's possible that I used the wrong method or DVD burning format (good luck figuring out the +, - and R/RW of the DVD formats).

So I now have a DVD of my wedding that took 7.5 hours to produce, and that I can watch on exactly one machine. And I have to return that machine next week.

Boy was that fun.

Shaw can be reached at kshaw@nww.com.

With AVD's Instant DVD 2.0, you'll need to have a DVD burner with your PC.

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EDITORIAL

John Dix

MCI preens for its coming out

With a nod from the judge overseeing MCI's bankruptcy proceedings, the carrier has been cleared to emerge from Chapter 11 early next year.

Of the $40 billion-plus in debt the company had when it sought Chapter 11 protection, MCI should have less than $6 billion on its books when it starts anew. That's more than the $3.5 to $4.5 billion it was hoping to end up with, but a fraction of what other companies are carrying — BellSouth, $14.9 billion; Sprint, $17.2 billion; AT&T, $17.4 billion; SBC, $18.2 billion; Qwest, $22.5 billion; and Verizon, $45.4 billion.

To put it in perspective, consider debt as a percentage of revenue. Even though MCI's sales this year are expected to be about $10 billion less than the 2001 high of $35 billion, its debt will be only 24% of revenue vs., say, AT&T's debt at 46%. The lighter load should make MCI more nimble and able to take bigger gambles, which is what scares competitors.

Another interesting change that will show up on MCI's new balance sheet is an amazing swing in asset value. According to "Restoring Trust," the report to the court about MCI governance by appointed monitor Richard Breeden, MCI listed $104 billion in assets in March 2002, with "approximately $45 billion in goodwill and $39 billion in the carrying value of its property, plant and equipment (sometimes referred to as PP&E). When it completes its opening date balance sheet on emergence from bankruptcy, the prior $104 billion in assets is likely to have been reduced to approximately $20 billion. The company has announced that it believes all its goodwill is permanently impaired (worthless) in value (if indeed such value ever existed), and that its PP&E should be written down by approximately $29 billion."

The history detailed in the report is fascinating reading (see www.nwfusion.com, DocFinder: 8438), and the corporate governance ideas Breeden puts forth will result in MCI emerging from bankruptcy with some of the strictest, most-progressive management thinking anywhere.

But the market MCI emerges into is still troubled, best characterized by AT&T's on-again off-again wedding dance with BellSouth. As nicely positioned as AT&T is with its modern network and reputation with big business, its efforts to find a regional Bell operating company partner is indication enough that colossal change is still to come.

It is not unreasonable to expect AT&T and MCI to be swallowed by RBOCs and the market to settle out with three or four national, all-purpose players. Until then, we welcome the diversity that a more-healthy MCI brings back.

— John Dix
Editor-in-Chief
jdix@nww.com

opinions!

Lighten up

While I think Mark Gibbs makes some valid points about productivity in his Backspin column "Collaboration technology: Just a lot of noise?" (DocFinder: 8428), I'm not sure I like the vision he creates of how a company should be run. Where I work, we don't use instant messaging, and I'm trying to discourage it because I think it's too vulnerable to a growing number of exploits. But Gibbs' notion that even e-mail should be closely monitored, the implication being that jokes sent to fellow employees is a waste of company resources, irritates me.

We work hard and take care of our business. But the fact that we pause in the day to laugh at a good joke in no way makes us less productive — it makes us more so. I don't want to work for a company so uptight that jokes and laughter are barred in the name of productivity and political correctness.

Pat Brown
Technical support analyst III
The Economical Insurance Group
Waterloo, Ontario, Canada

Taking anti-spam too far

I am a long-time *Network World* reader and am committed to never missing an issue. It always provides me with the technical direction and information I require for my IT projects, as well as insight and elegant humor and criticisms of the IT world.

I enjoyed your recent cartoon lampooning California's anti-spam law (Oct. 6, page 42). My company has recently encountered a similar type of scenario when sending e-mail to AOL subscribers. The bottom line is, if you cannot discern legitimate e-mail from spam, then you cannot institute a blanket block of all e-mail. Instead, you must do the best you can to remove spam and allow legitimate e-mail to be processed and forwarded.

Brian Greenberg
Dillon, Colo.

GPL: Good or bad?

After reading Chris Sontag's Face-off column on why the General Public License is bad for the software industry (www.nwfusion.com, DocFinder: 8427), I can't resist taking a poke at him for his statement that, "If software is free, companies won't be around to service that software, provide customer support and produce upgrades."

So the way I see it, things won't change much. Service? Support? We already have to buy those from third-party vendors.

I'm surprised Sontag used the words "customer" and "support" next to each other, because the software companies I'm familiar with don't have a clue what that phrase means. But I must admit, he is correct about the last item, as software vendors certainly are capable of producing upgrades.

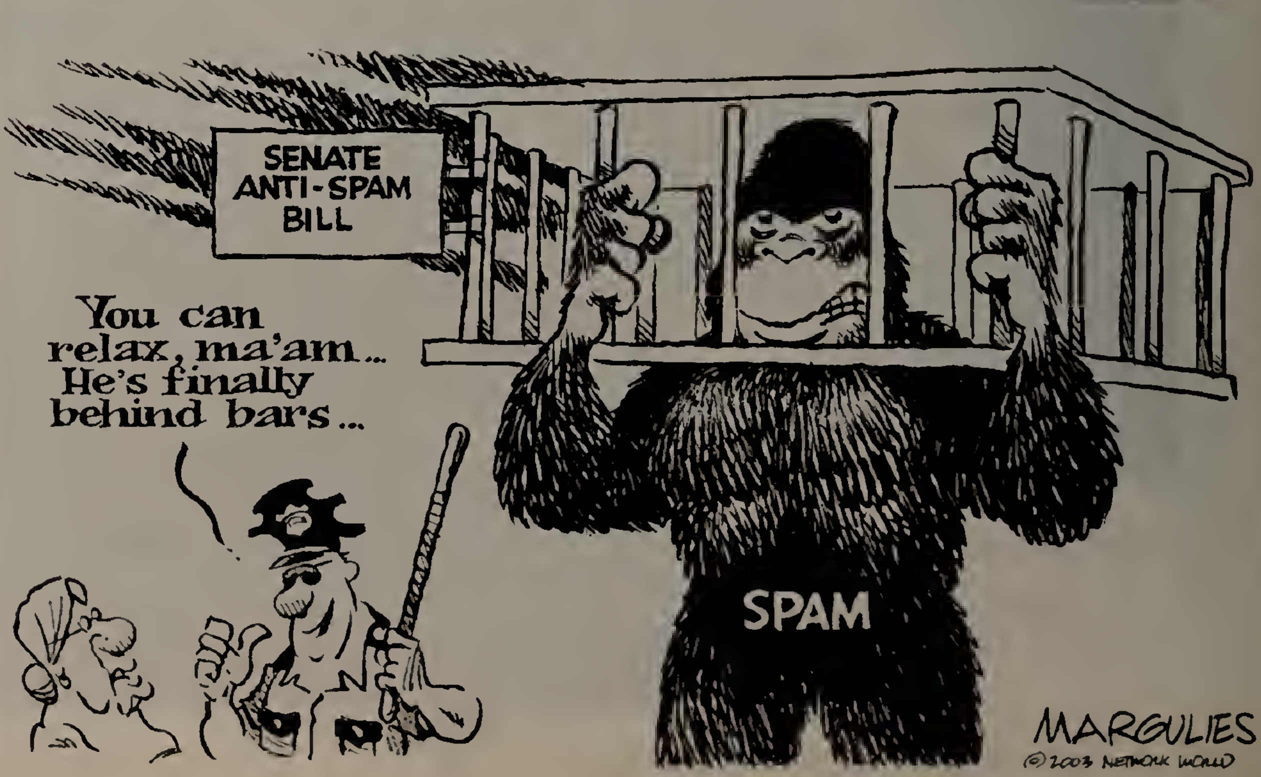
Ted Neff
Vice president
Reynolds Engineering & Equipment
Muscatine, Iowa

Both Bradley Kuhn and Chris Sontag have it wrong. From the standpoint of both business and supporting open source, the BSD License has a lot more to offer. Under the BSD License, the code you write within your business is yours, even if it's added to the operating system code. The GPL does not allow for this, and it's where companies are getting them in trouble. Hopping on the Linux bandwagon does not serve businesses well, other than having wildly successful IPOs and crashing and burning.

Trish Lynch
Annapolis, Md.

E-mail letters to jdix@nww.com or send them to John Dix, editor in chief, Network World, 118 Turnpike Road, Southborough, MA 01772. Please include phone number and address for verification.

More online! **www.nwfusion.com** Find out what readers are saying about these and other topics. **DocFinder: 8426**



PACKET EVANGELIST

Steven Taylor

VoIP security still a major issue

In a previous column (www.nwfusion.com, DocFinder: 8326), I discussed how budgetary constraints are impeding voice-over-IP implementation. Another major impediment is security concerns, according to Webtorial's recent 2003 VoIP "State of the Market Report" (available for download at www.webtorials.com). In this worldwide survey of end users, about 40% of the approximately 300 respondents cited security as one of the top four reasons why they haven't deployed VoIP.

Digging deeper into the results, about 25% of the respondents cited concern about security of the network infrastructure as a major problem, while the rest took a less drastic view of the problem. When asked about security of the network infrastructure vs. the security of voice content, the greater concern was about the infrastructure.

The recent Blaster and SoBig-f attacks demonstrate that some of these concerns are well-founded — especially if the network infrastructure is not appropriately cared for. Some VoIP users who did not apply patches to protect against Blaster found their VoIP networks bogged down along with their data applications. Blaster-type attacks will force companies to take patches and upgrades more seriously. This additional diligence in securing the data network will have the side benefit of protecting the VoIP infrastructure.

But SoBig-f exposed a separate and equally disturbing VoIP vulnerability. By affecting e-mail, SoBig-f had a severe effect on thousands — if not millions — of PCs. While e-mail problems were being resolved, the PC became unusable for other applications. If you're dependent on your PC for telephony, when your PC becomes unstable, your phone becomes unstable, too. This raises some serious questions about the wisdom of adopting soft phones — software that turns PCs into IP-based phones — as a part of overall VoIP implementation.

According to the "State of the Market Report," end users strongly favor maintaining their traditional phones as part of their overall voice infrastructure. When asked about the importance of integrating traditional phones into the VoIP infrastructure and given five choices from "not important at all" to "extremely important," more than half of the respondents chose "very important" or "extremely important." It's not clear whether security concerns were a part of this desire to maintain traditional phones at the time the survey was taken, but it is another issue that must be considered.

Overall, virus/worm incidents shouldn't have a major effect on the VoIP market. These are data security issues, and when they are addressed for the data network, the VoIP installation will be addressed by default. But virus/worm incidents do indicate that if you're getting ready to go full-throttle with VoIP, it's common sense to apply any applicable patches to keep your infrastructure up to date.

Taylor is president of Distributed Networking Associates and editor/publisher of Webtorials.com. He can be reached at taylor@webtorials.com.

> **If you're dependent on your PC for telephony, when your PC becomes unstable, your phone becomes unstable, too.**

INDUSTRY COMMENTARY

Frank Dzubeck

Blades: Platform of the future

In a column earlier this year (www.nwfusion.com, DocFinder: 8429), I predicted that the communications platform of the future would be the blade server. My prediction is beginning to be played out on blade servers from HP, IBM and Sun. Companies that have announced communications blades for the IBM eServer BladeCenter include F5 Networks, Myricom Netilla, and Nortel.

Not to be outdone, the HP ProLiant Blade Server has a GbE2 Interconnect Switch option, which is a 24-port gigabit switch module designed by Nortel; infrastructure option blades for traffic management and load balancing from F5; and a VPN/firewall blade from Check Point. Meanwhile, the Sun Fire Blade Platform has added "specialty" blades using onboard hardware acceleration for VPN and SSL proxy functions, content load balancing, firewall security and cache features.

Cisco has been busy focusing on transforming its existing products into competing multifunctional platforms. For some time, Cisco has been adding functionality using add-on cards for the router or LAN switch. Firewall, cache, VPN, load balancing and security cards exist for multiple versions of the Cisco router and LAN switches using IOS.

Cisco's recently announced CallManager Express and Unity Express join its CallManager, CallManager SRST and Unity products to add VoIP within the router and LAN switch. Voice services are delivered via Cisco's access routers, including the Cisco 1751, 1760, 2600XM, 3600-series and 3700-series routers, and the Access Gateway Module, available on the Cisco Catalyst 4500-series switch. The key ingredient in this strategy is the inclusion of voice applications (PBX, Automated Attendant, mail) into IOS.

The third platform created by Cisco is the MDS 9000 Multilayer Intelligent Family of storage-area network directors and fabric switches. IBM has ported its TotalStorage SAN Volume Controller storage software into the Cisco MDS 9000. This integrated solution will let customers administer volume management, data replication and point-in-time copies over the network across multiple storage subsystems.

Which approach will win out in this battle for control of the communications platform?

My opinion has not changed; the blade server will become the communications platform, for many reasons. These include cost; open, published hardware/software architecture; sophisticated third-party developer alliance programs; third-party channel sales assistance; the use of standard operating systems; scalability at low cost; the reliability of the platform; autonomic functionality; and the ability for dynamic provisioning/manageability.

Then why isn't there a rush to replace communications platforms?

There are several reasons:

- The legacy problem of the installed base — not insignificant considering the number of LAN switches and routers installed in corporate data centers.
- Users' relative inexperience with blade servers.
- Lack of multiple-vendor products certified for insertion in a blade server; the add-on blade has yet to become a commodity.
- The management "island" problem of policy, systems, networking and storage. Web services and other standards could address this critical issue — but only time will tell.
- Last, and most significantly, there is the issue of IOS — impenetrable by a third party, as pervasive as Microsoft's Windows operating system and as proprietary as IBM's legacy SNA. Unfortunately, until the industry comes to grips with the IOS issue, the blade server will remain a communications platform "work in progress." Cisco has publicly committed to implementing the open interfaces specified in the Open Grid Services Architecture. Although initially focused on grids, these Web services interfaces one day might become the only open software portal into IOS services/applications. Use of these interfaces, also contained in servers and storage, would set a level playing field for communications functionality in the blade server.

Dzubeck is president of Communications Network Architects, an industry analysis firm in Washington, D.C. He can be reached at fdzubeck@commnetarch.com.

> **My opinion has not changed; in time, the blade server will become the communications platform.**

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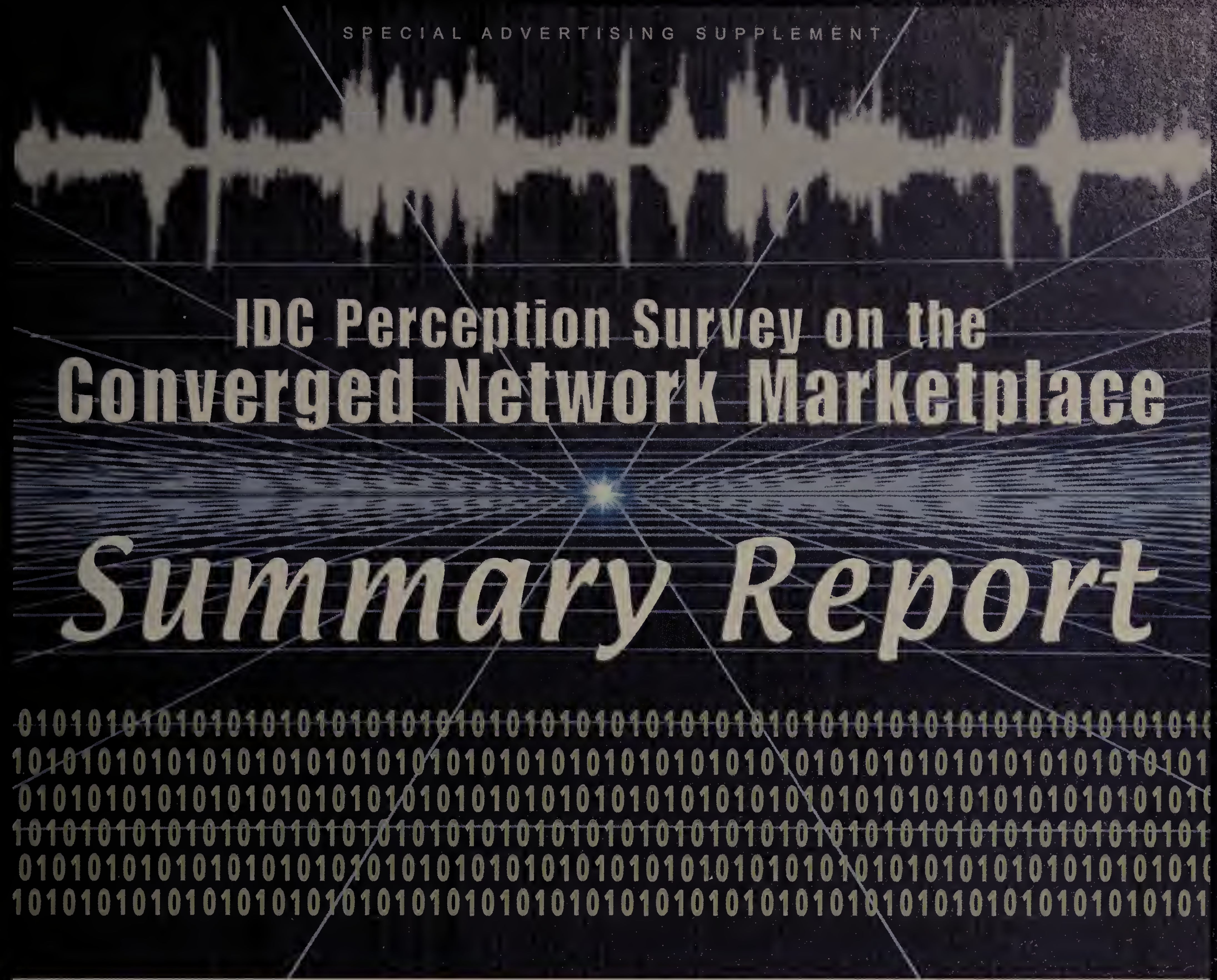


IDC Perception Survey on the Converged Network Marketplace

Summary Report

A growing number of organizations are considering implementing converged network solutions as they look to maximize their IP infrastructure investments. In addition, many organizations are considering the advantages of integrating their traditional data infrastructure with their voice and video infrastructure needs as they start to reinvest in infrastructure.

Therefore, IDC and NetworkWorld conducted a joint study of the purchasing trends and business requirements for converged network infrastructure services as well as the perceptions of vendors providing such services. The study was conducted in early 2003 and consisted of 207 decision makers from organizations of various sizes and in different vertical industries. One common thread among respondents is their participation in the decision-making process for technology purchases. Each respondent has a role in purchasing a variety of IT hardware, software, and services.

Written by Christine Tenneson, Program Manager for Network Lifecycle Services and Software and System Support Services at IDC

An Executive Summary Produced by IDC

From a company size perspective, small businesses (1 to 99 employees) made up 34% of the survey population, medium-sized businesses (100 to 999 employees) represented 25%, large enterprises (1,000 to 9,999 employees) represented 25%, and very large enterprises (10,000 or more employees) represented 16%. In addition, respondents were asked about their companies' annual revenues. Of the 207 decision makers, 121 (58%) work for organizations that generate less than $99.9 million, 40 (19%) are employed by organizations with between $100 million and $1 billion, and 46 (22%) work for organizations that generate more than $1 billion. From an industry perspective, respondents came from the sectors shown in Table 1.

TABLE 1: Vertical Industry of Respondents

	Number of Respondents	% of Respondents
Carrier/voice/data/ISP	26	12.6
Industries (mining, construction, petroleum, refining, agriculture, forestry)	24	11.6
Consulting (independent)	21	10.1
Media/TV/cable/radio/print	20	9.7
Transportation	18	8.7
Manufacturing (computer/communications/OEM)	16	7.7
Healthcare services	14	6.8
Government (federal, state, and local)/military	13	6.3
Finance/banking	13	6.3
Reseller/VAR/VAD/integrator/distributor (computers/communications)	11	5.3
Education	9	4.3
ASP/SSP/MSP	9	4.3
Hospitality/entertainment/recreation	4	1.9
Insurance/real estate/legal	3	1.4
Retail/wholesale trade/business services	2	1.0
Utilities/process	2	1.0
Web hosting/HSP	2	1.0

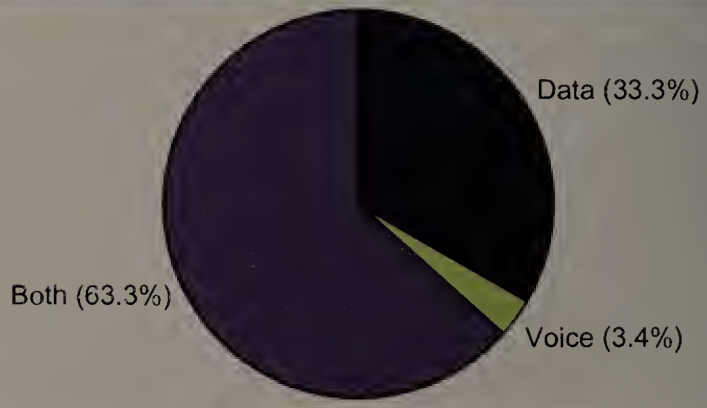
Source: IDC, 2003 n = 207

> ... a lack of resources and funding continues to be the number one reason for not implementing a converged network solution at this time.

Respondents were asked if they are currently responsible for their organizations' voice or data, or both. An overwhelming 63.3% of respondents are responsible for both voice and data (see Figure 1).

FIGURE 1: Primary Areas of Responsibility

Q. What are your primary areas of responsibility?



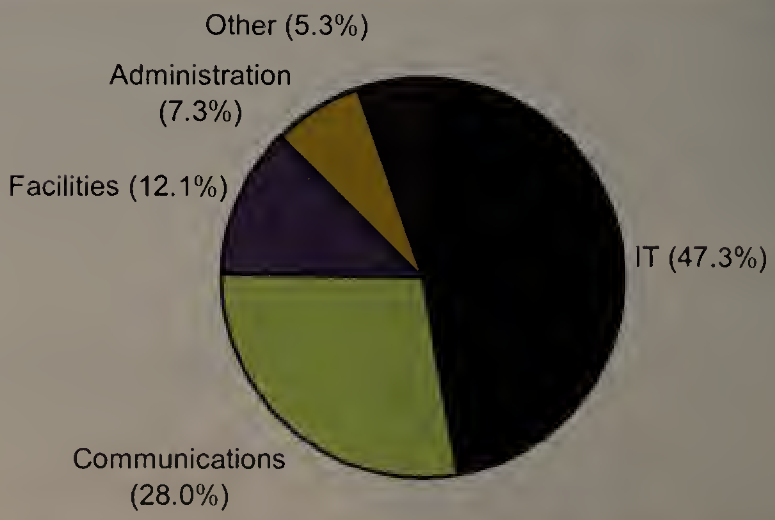
Source: IDC, 2003 n=207

Respondents were asked if their organizations' voice and data networks are managed by separate functions within the company. Forty-eight percent of respondents reported that their organizations' voice and data networks are not managed by separate functions within the company, whereas 52% of respondents reported that their organizations' voice and data networks are managed by separate functions within the company.

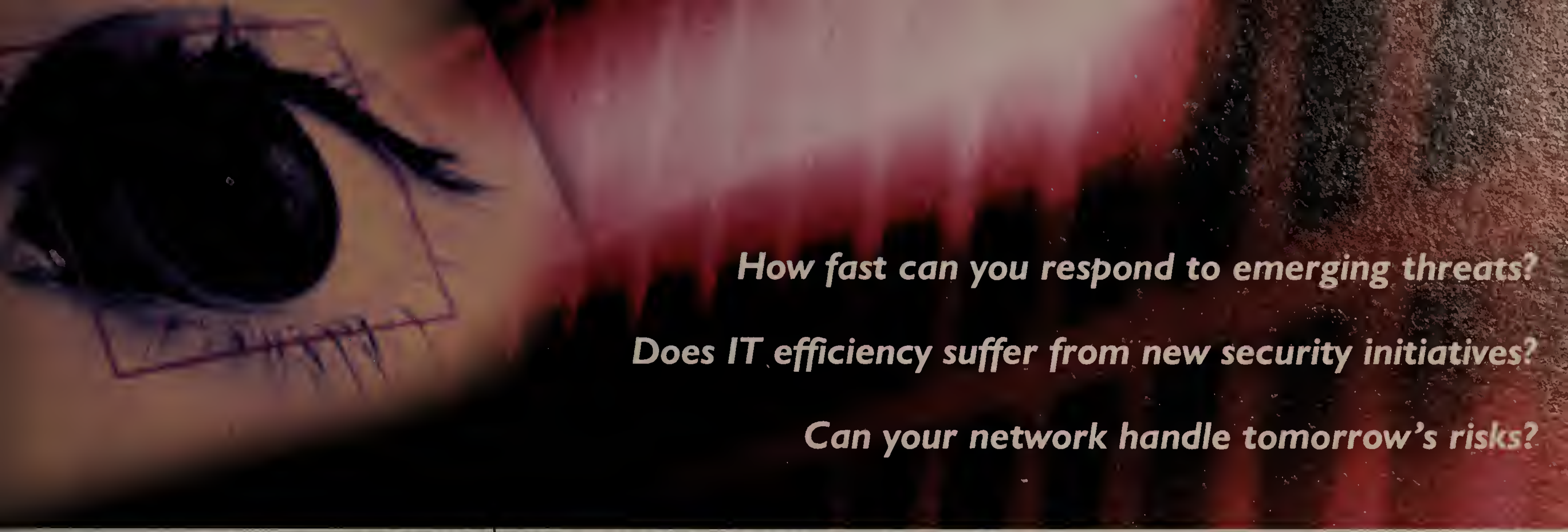
When asked which department is responsible for voice, 47.3% of respondents mentioned the IT department (see Figure 2).

FIGURE 2: Department Responsible for Voice

Q. Which department has responsibility for voice?



Source: IDC, 2003 n=207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For the CXO and Business Manager . . .

- Minimize exposure to internal and external threats: theft, business disruption, negative publicity
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For the IT/Network Manager . . .

- Secure the network from the edge to the core
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To gain a better understanding of where enterprises are today in their deployment and use of converged network infrastructure services, we initially asked respondents to identify the status of their organizations' planning and implementation efforts with regard to a converged network infrastructure solution. Their responses are as follows:

- 28% of organizations are in the early stages, considering implementing a converged network infrastructure solution initiative internally.
- 25% of organizations are in the early stages, considering implementing a converged network infrastructure solution initiative with the help of an outside vendor.
- 21% of organizations have already implemented a converged network infrastructure solution initiative within their environment.
- 28% of organizations considered and then decided against such a project.

Organizations Considering Implementing a Converged Network Infrastructure Solution Internally

Of organizations that are currently considering implementing a converged network infrastructure solution initiative internally, 13% stated that they would only consider using internal resources for the consultation, planning, and design phase of the engagement. Twenty-two percent of respondents in this population stated that they would only consider using internal resources for the installation and implementation phase. Interestingly, all organizations cited their intention to use an outside firm for maintenance.

Organizations were asked what services firms they would consider using for each phase of the network engagement: consulting, planning, and design; installation and implementation; ongoing maintenance; and managed services.

Of this population, 52% stated that they would consider using Cisco for the consultation, planning, and design of a VoIP solution. Respondents also identified the following companies: AT&T (33%), IBM (31%), Avaya (30%), Nortel (24%), Verizon (20%), Unisys (13%), SBC (9%), EDS (7%), and NextiraOne (4%).

Organizations Considering Implementing a Converged Network Infrastructure Solution with External Assistance

Of organizations that are currently considering implementing a converged network infrastructure solution initiative with the help of an outside vendor, 6% of respondents indicated that they would only consider using internal resources for the installation and implementation phase.

Like the previously discussed set of respondents, these organizations were also asked what services firms they would consider using for each phase of the network engagement: consulting, planning, and design; installation and implementation; ongoing maintenance; and managed services.

Of this population, 67% stated that they considered using Cisco for the consultation, planning, and design of a VoIP solution. Respondents also identified the following companies: Avaya (37%), Nortel (29%), AT&T (16%), Verizon (12%), HP (8%), IBM (6%), and SBC (2%). No respondents mentioned EDS as a vendor they considered using for this phase.

> ...the most important three decision factors for selecting a vendor to implement a converged network solution are quality of product, service and support offerings, and price of product

Organizations That Have Already Implemented a Converged Network Infrastructure Solution

Some of the most interesting results can be attributed to the feedback provided by organizations that have already implemented a converged network. These organizations were asked to rate their satisfaction with each of the following stages of the network life cycle on a scale of 1 to 5, with 5 being the highest score:

- Consulting, planning, and design phase of the converged network services engagement
- Installation and implementation phase of the converged network services engagement
- Ongoing maintenance support received from an outside vendor
- Managed services received from an outside vendor
- Technology and product after implementation

These results are illustrated in Tables 2-6.

TABLE 2:

Respondent Satisfaction with Consulting, Planning and Design: Respondents Who Have Already Implemented a Converged Network Infrastructure Solution Initiative

Q. Please rate, on a scale of 1 to 5, with 5 being the highest score, your satisfaction with the following: consulting, planning, and design phase of converged network services engagement.

Score	Number of Respondents	% of Respondents
1	9	20.5
2	3	6.8
3	5	11.4
4	9	20.5
5	18	40.9

Source: IDC, 2003

n= 44

TABLE 3:

Respondent Satisfaction with Installation and Implementation: Respondents Who Have Already Implemented a Converged Network Infrastructure Solution Initiative

Q. Please rate, on a scale of 1 to 5, with 5 being the highest score, your satisfaction with the following: installation and implementation phase of converged network services engagement.

Score	Number of Respondents	% of Respondents
1	6	13.6
2	9	20.5
3	14	31.8
4	11	25.0
5	4	9.1

Source: IDC, 2003

n= 44

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TABLE 4:

Respondent Satisfaction with Ongoing Maintenance: Respondents Who Have Already Implemented a Converged Network Infrastructure Solution Initiative

Q. Please rate, on a scale of 1 to 5, with 5 being the highest score, your satisfaction with the following: ongoing maintenance phase of converged network services engagement.

Score	Number of Respondents	% of Respondents
1	7	15.9
2	8	18.2
3	21	47.7
4	5	11.4
5	3	6.8

Source: IDC, 2003 n = 44

TABLE 5:

Respondent Satisfaction with Managed Services: Respondents Who Have Already Implemented a Converged Network Infrastructure Solution Initiative

Q. Please rate, on a scale of 1 to 5, with 5 being the highest score, your satisfaction with the following: managed services phase of converged network services engagement.

Score	Number of Respondents	% of Respondents
1	12	27.3
2	17	38.6
3	2	4.5
4	9	20.5
5	4	9.1

Source: IDC, 2003 n = 44

TABLE 6:

Respondent Satisfaction with Implemented Technology: Respondents Who Have Already Implemented a Converged Network Infrastructure Solution Initiative

Q. Please rate, on a scale of 1 to 5, with 5 being the highest score, your satisfaction with the following: technology and product once implemented.

Score	Number of Respondents	% of Respondents
1	11	25.0
2	7	15.9
3	4	9.1
4	8	18.2
5	14	31.8

Source: IDC, 2003 n = 44

Respondents who indicated that they have already implemented a converged network solution were most satisfied with the consulting, planning, and design phase. Exactly 61.4% of the 44 respondents rated this phase a 4 or a 5 on a 1 to 5 scale. Respondents who indicated they have already implemented a converged network solution were least satisfied with the ongoing maintenance phase. Only 18.2% of the 44 respondents rated this phase a 4 or a 5 on a 1 to 5 scale. These results demonstrate the importance of working with a maintenance provider that offers a portfolio of services designed to keep converged networks up and running.

Organizations That Decided Against a Converged Network Infrastructure Solution

A number of respondents indicated that they did consider implementing a converged network infrastructure solution and then decided against such a project. When asked why they are no longer considering implementing a VoIP solution at this time, respondents provided the following reasons, which appear in order of importance:

- Cost
- No particular applications that require VoIP
- Technology does not work well with existing infrastructure
- Lack of internal expertise
- Lack of standards

Key Findings

Key findings of this study include the following:

- The lack of resources and funding continues to be the number 1 reason that organizations are not implementing a converged network solution at this time.
- Organizations cited quality of product, service and support offerings, and price of product as the top 3 decision factors for selecting a vendor to implement a converged network solution.
- The market for converged network services throughout the network life cycle continues to be fragmented.

Many organizations cited large OEMs as the vendors they would most likely approach for convergence assistance. These organizations most frequently cited Cisco, AT&T, Avaya, IBM, Verizon, and Nortel as firms they would consider using for network services. However, many organizations reported that they would most likely approach smaller, specialized services firms for convergence expertise. Therefore, an opportunity exists for both large and small services firms to meet customer demand for network convergence services.

About The Author

Christine Tenneson is the Program Manager responsible for IDC's Network Lifecycle Services and Software and System Support Services research programs. In this position, she provides research, market analysis, and consulting on key aspects of the network consulting and integration and hardware and software support markets. Specific research areas include competitive analysis and sizing of the markets for network design, consulting, integration, and hardware and software support services, pricing and packaging of these services, and worldwide trends for these services.

Ms. Tenneson holds a Bachelor of Science degree in Communications from Salem State College and a Masters in Business Administration with a concentration in Marketing from Clark University.

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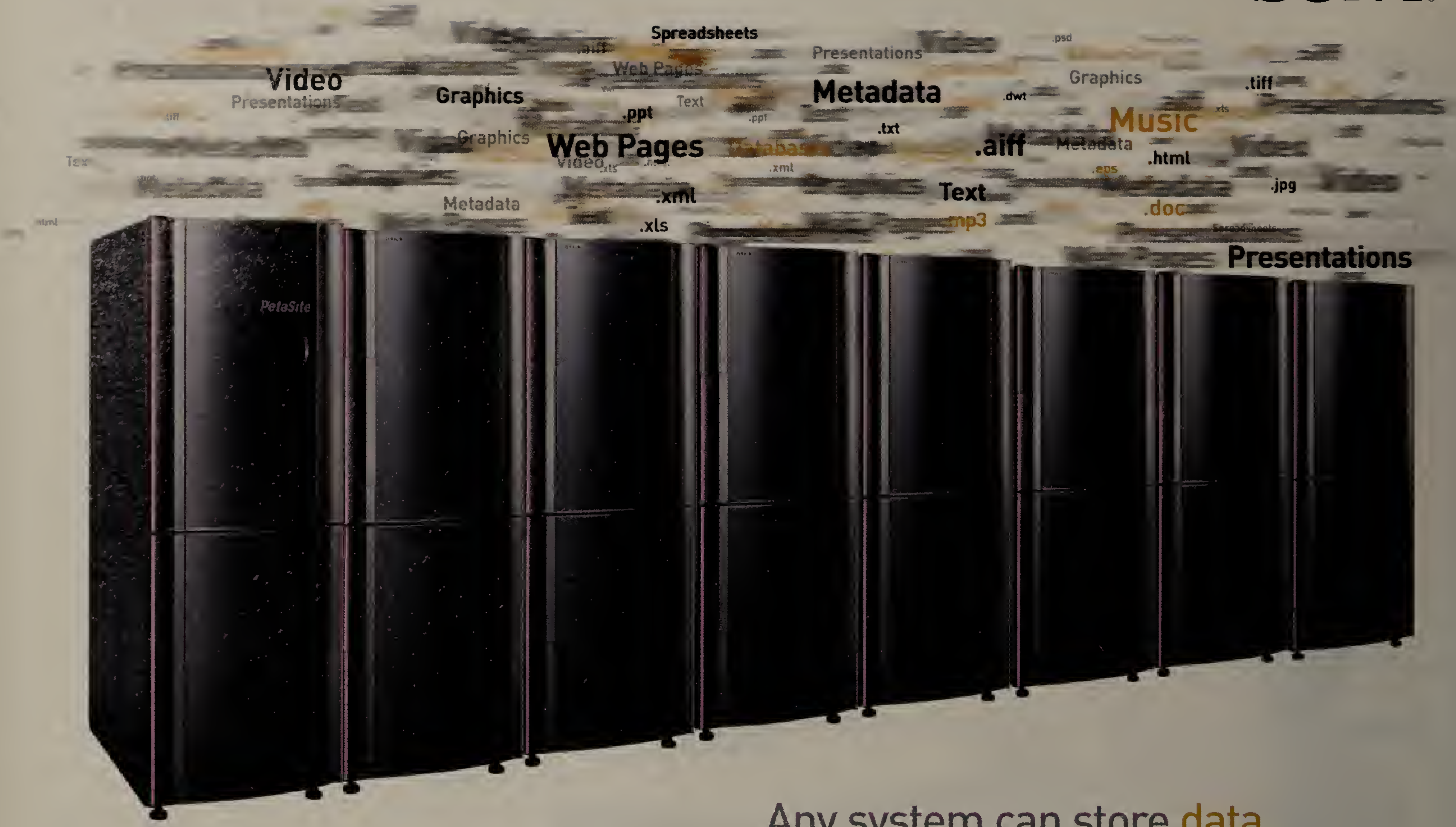

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Cover illustration by Brian Stauffer

From the editor

Thomas Powell, CEO of San Francisco Web development firm PINT and a member of Network World's Global Test Alliance, is often frightened by the network/application development divide he sees within companies. Particularly scary, he said in a recent interview, are the risks companies take when the network staff and applications developers don't communicate on Web security.

The network/application development divide is a holdover from the days when IT departments operated as silos. But IT executives who are extending their enterprise infrastructures and striving for real-time businesses, should not tolerate such a divide any longer.

You must insist that your network staff and application developers take joint responsibility for protecting applications that extend to customers, suppliers and business partners via the Web. And you must bring them together on performance issues. They must agree on a methodology for monitoring and reporting on performance — one that will flag problems immediately and get them fixed quickly.

Closing the divide won't be easy, as culture can be a powerful inhibitor.

But a good start is insisting that network professionals and application developers team up on any project that will result in the company's extension across the Web.

A little knowledge can go a long way, too. Application developers might not have any idea what the latest Web threats are, while the network guardians know every nuance about them. Sharing this information will help developers figure out ways to build appropriate security mechanisms into the application, for example.

So before you turn today's extended enterprise into tomorrow's real-time enterprise, ensure nothing less than full cooperation between the network and application development departments. The business depends on it.

— Beth Schultz
Editor, Signature Series
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Johnson, left, and Blazevich of chemical company Sigma-Aldrich burned their dot-com competitors by thinking like customers.

DAN DONOVAN

Web integration: Then & now

B2B e-commerce pioneers Ford Motor Credit, Sigma-Aldrich and Staples continue to define the cutting edge.

BY PAUL DESMOND

In its annual "Marketing to Life Scientists" study published in July 2003, market research firm BioInformatics notes that the Web is the No. 1 medium for new product information, eclipsing catalogs, print ads and trade shows. "Prior to 1997, the same survey didn't even include the Web as an option," says Brad Johnson, director of e-business for Sigma-Aldrich, a St. Louis chemical company that sells to life scientists and puts a lot of stock in the study.

In the mid- to late 1990s, Sigma-Aldrich was among the companies getting business-to-business Web efforts off the ground, making decisions on architectures and vendors that it couldn't be sure would last for the long term. But it became well known in the chemical industry for its early e-commerce efforts, just as Ford Motor Credit did in the automotive financing business and Staples in the retail world. Sigma-Aldrich and Ford Credit, in fact, are past winners of our E-comm Innovator Award, while Staples has shared its experiences with us throughout the years. (Read their profiles at www.nwfusion.com, DocFinders: 8423 and 8424, respectively.)

"Back in 1998 or '99, there were no real market leaders in this space," says Larry Blazevich, CIO at Sigma-Aldrich. "Everybody was lined up at the starting gate, and the horse race was on."

IMPRESSIVE RECORDS

In 2003, the race is far from over, but it's lots easier to handicap. Market leaders have emerged in the vendor and user communities. Sigma-Aldrich's Web site, for example, was named best in its class worldwide in the July BioInformatics study. The company's sales numbers seem to indicate the study is dead on, with e-business sales increasing from $4 million

> **"In the second phase,** we'll look at moving more of the integration back to the servers. . . . What we really want to do is take the desktop piece out and thin the client out completely."
>
> **Terry Bone, manager of frameworks and architecture at Ford Credit**

in 1998 to a projected $200 million in 2003. It even buried at least a couple of dot-com competitors, the marketplace companies Chemdex (belly up in early 2001) and SciQuest (now operating as an IT product and service provider).

Johnson and Blazevich say their site has evolved in a number of ways over the years. One is business-to-business integration. After successfully integrating its Web site with a new SAP ERP system to get its own house in order, Sigma-Aldrich is doing much the same with its customers. It is integrating the site with its procurement systems. Another focus is on providing useful content by enhancing the amount and type of information available on the site. A third area is globalization, so the site can be relevant to customers in each of the 160 countries in which it conducts business, yet still maintain overall consistency.

Ford Credit likewise continues to add to its Web services infrastructure, the roots of which date to 1995, when the company first investigated the use of Java. The Dearborn, Mich., company now has more than 40 application suites built on its Java 2 Platform Enterprise Edition (J2EE) frameworks and services, up from 23 going into this year. In part because of Ford Credit's success, parent company Ford Motor also is concentrating on J2EE, decreeing that all new line-of-business applications be built on the technology, says Terry Bone, manager of frameworks and architecture at Ford Credit.

A shining example of Ford Credit's J2EE Web services efforts is XNet, a portal for receiving and processing credit applications. Launched in August, the portal already processes half of the applications that come from Ford dealers. That amounts to about 150,000 transactions per day, or nearly two per second, Bone says. True to the reusable nature of Web services, the same platform in September went live to tie Ford Credit into RouteOne, a joint venture it forged in April 2002 with DaimlerChrysler Services, General Motors Acceptance Corp. and Toyota Financial Services. RouteOne facilitates the loan-origination process in dealerships.

Staples, meanwhile, saw orders placed electronically reach 53% of volume in the fourth quarter of its most recent fiscal year, which ended Feb. 1. And net income increased 47% for the second quarter of this year on a sales increase of only 11%. By last count, customers that have standing contracts with Staples place 70% of their orders electronically, says Mike Ragunas, vice president of technology strategy and architecture at the Framingham, Mass., office-supply retailer. At least some of those results can be attributed to the company's focus on making it easy for customers to shop at Staples, whether online, in the store or from a catalog.

Often that effort involves making Staples.com simple to use. For example, the "Easy Reorder" feature helps customers quickly find items they have ordered previously — handy for repeat items such as fax and printer toner cartridges. Similarly, a "Help Me Decide" tool in the electronics section asks customers a series of questions to help them find the printer, PDA, computer or camera model that best fits their needs. (See graphic, page 64.)

GLENN TRIEST

CUSTOMER-FOCUSED

Such efforts result from a commitment to putting customers first. "I look less at what technologies are critical and focus more on what is going to make the experience easier for the customer," Ragunas says. Easy Reorder required only relatively simple programming and database work. "The bigger challenge was working with customers on finding the right way to present it," he says. He adds that Staples puts significant effort into usability studies "so when we put something new out, we know customers will get it."

Sigma-Aldrich likewise focused its investments on enabling easier online buying rather than on streamlining its own supply chain, as so many other companies did. "Stragically, we saw the customer side, the demand side, as being more important," Johnson says.

Much of the effort went to making more content available on the site and making it easy to find. Many chemicals require a Material Safety Data Sheet that details safe handling requirements and a certificate of analysis that breaks down their exact composition — crucial information for the scientists and researchers that are Sigma-Aldrich's customers. Previously, customers ordering from a catalog would have to phone to get these documents. "The Web as a medium has succeeded in integrating the buying experience so you can move from selection to buying in one click of the mouse," Johnson says.

Because the system has 250,000 chemicals from which to choose, finding the right one is also a challenge. Sigma-Aldrich came up with a Web-based tool that lets customers draw a picture of the structure of the chemical compound they seek. The picture is translated to text describing the compound, and the text is matched against products in the Sigma-Aldrich database. The closest match is presented to the customer, also in a graphical format.

See Integration, page 62

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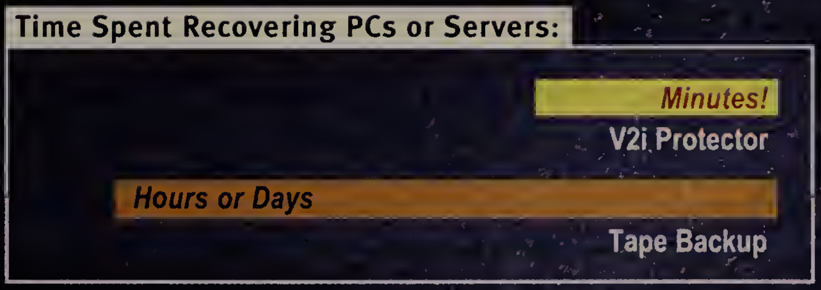

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Words of wisdom on Web integration

When thinking about your extended enterprise projects, consider these words of advice from IT executives at business-to-business e-commerce pioneers Ford Credit, Sigma-Aldrich and Staples.

- **Think like a customer.** If you do that, you'll focus on the applications, functions and services that result in commercial value, says Brad Johnson, director of e-business for Sigma-Aldrich in St. Louis. Staples in Framingham, Mass., likewise puts a premium on features that promote ease of use.

- **Don't dictate integration requirements.** Rather, support a number of options, including integrating with popular procurement systems, via the Web, electronic data interchange or even fax, so customers can pick what works best for them. Sigma-Aldrich lets customers print out a Web-based order form and fax it in. Using an e-commerce application from Haht Commerce, the company can translate the fax image to XML and feed it directly to its SAP system for processing.

- **Think strategic, act tactical.** Terry Bone, manager of frameworks and architecture at Ford Credit, in Dearborn, Mich., recommends companies have a strategic plan for implementing complex technologies such as Web services, but tackle it in practical, tactical chunks. Take the lessons learned from each experience and continually modify your strategy.

- **Set up Centers of Excellence.** At Ford Credit, a Center of Excellence group acts as a conduit between different application development teams, ensuring that best practices are communicated and technology is reused. Also take the time to research existing industry best practices and development patterns.

- **Build a flexible foundation.** Staples years ago invested in building out a high-capacity network to its stores, without necessarily knowing how all the capacity would be used. Now the company can move quickly to offer additional services to its stores, such as kiosks that offer in-store access to all the features of Staples.com, says Mike Ragunas, vice president of technology strategy and architecture at the retailer. This includes the ability to arrange furniture deliveries and order items not carried in stores. (Staples.com carries 45,000 items, whereas the typical store has about 7,000.)

- **Think about security early.** Dealing with security schemes such as authorization and single sign-on is simpler when done early in the development process rather than when they are tacked on after the fact.

— **Paul Desmond**

KATHY TARANTOLA

Integration

Continued from page 60

Tools like these result from close IT-business alignment at Sigma-Aldrich, a quality that all three early adopters say is crucial to success. "Brad's job is to find out what customers are looking for, how they want to search and how to present it; our job is to provide the capability," Blazevich says. "We do have a very close relationship between the IT side and the business side. I think Brad spends more time in my office than I do."

> "I look less at what technologies are critical and focus more on what is going to make the experience easier for the customer."
>
> **Mike Ragunas, vice president of technology strategy and architecture, Staples**

Customer demand was instrumental in driving Staples and Sigma-Aldrich to integrate their respective Web sites with customer procurement systems, such as those from Ariba, CommerceOne, Oracle and SAP. Such initiatives let customers use their own procurement systems to order from their chosen supplier, without ever visiting the supplier's Web site. Each company also accepts orders in various other means, including electronic data interchange, custom electronic catalogs and fax. "We're trying to be flexible in letting customers work with us in any way that meets their needs," Staples' Ragunas says.

Such efforts don't necessarily make the ordering process any easier on the supplier end, because orders are handled just as if they were placed on the Web. For example, at Sigma-Aldrich orders from customer procurement systems go to the firm's back-end SAP system for processing, just as orders coming from the Web site do. But tying in to procurement systems creates a tighter bond with the customer. "We have evidence that we become a preferred supplier, which manifests to 1% to 3% additional sales in the first 12 to 18 months of deployment," Johnson says.

TECH TOOLS OF THE TRADE

Accomplishing a task such as integrating with a procurement system is where some serious technology comes into play, notably XML. Sigma-Aldrich uses an XML-based product from Haht Commerce to integrate with the handful of procurement systems it supports, while Staples.com uses XML-based tools from webMethods.

Ford Credit goes a step further, having leapt into not only XML, but also into Web services. The company has a series of reusable services and frameworks. A service essentially performs a specific function — perhaps faxing a document or paging someone — for use in any number of applications. A framework is a well-defined, tightly integrated set of services that tend to be repeated in each application, such as security, exception handling, accessing mainframe programs and performance logging.

In creating XNet, Ford Credit used a lot of the latest in Web services and J2EE tools, Bone says. That includes the Sun Java Web Services Development Pack, Java Architecture for XML Binding (JAXB), Simple Object Application Protocol (SOAP), Web Services Description Language (WSDL) and digital signature technology. To help make sense of it all and ensure the development effort could be reused again and again, it made sure it followed a well-defined "pattern."

The idea of using a pattern came from a JavaOne conference in 2001, where Bone met the authors of a book called *Core J2EE Patterns: Best Practices and Design Strategies* and liked what they had to say. "Developers implement solutions to recurring prob-

See Integration, page 64

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Integration

Continued from page 62

lems in lots of ways, but usually there are one or two well-established ways of doing it," Bone says. "Following those patterns, you're better off."

Bone had two of the authors examine the frameworks and services Ford Credit already had developed and try to match them with patterns documented in their book. With only minor modifications, often as simple as a name change, the team was successful in that effort. "We got a lot of value because now we had a book we could use as off-the-shelf documentation for our frameworks and services," Bone says. Ford Credit also contributed heavily to two new patterns documented in the book's second edition.

GETTING THIN

J2EE has proven cost-effective for Ford Credit. One example lies in Pinnacle, the core line of business application suite to handle loan origination at branch offices and long-term account servicing from six regional service centers. Pinnacle replaces a fat-client system called Compass, built on OS/2 and requiring servers at each of the 150 branches across the country.

Most of the business logic for Compass has moved to the J2EE platform that resides on two Sun Solaris machines in the Ford data centers. Branches require only thin client, browser-based systems. "Turning on branch users for Pinnacle means pointing them to a URL, setting up security profiles and doing a little bit of training," Bone says. "The rollout took about three months, compared to a couple of years for Compass."

With the branch rollout done, Ford Credit has turned to the account-servicing portion of Pinnacle. Customer service representatives need access to more applications than branch users do, with integration between them to avoid data entry duplication. So, even though it could not build a completely browser-based system, Bone's team thinned the client down considerably. Key to that effort is an internally developed Java application, dubbed the Desktop Integrator, which acts as a communications hub between all client-resident applications and the host servers, enforcing rules on what data will be passed when.

"In the second phase, we'll look at moving more of the integration back to the servers," Bone says. "What we really want to do is take the desktop piece out and thin the client out completely."

THE ROAD AHEAD

Looking forward, these pioneers say issues like standards, security, globalization and online customer interaction are the next set of vexing challenges.

For instance, XML is still difficult to work with. "The semantics aren't well-defined," Staples' Ragunas says. "Having XML doesn't mean you can talk with a partner. You have to define the way in which you're going to have a conversation. Those standards are still evolving."

Bone agrees, noting he worked with BEA Systems and Sun to flesh out each vendor's implementation.

Bone sees the security issue as opposing forces on a collision course: one side trying to lock down the network to protect it from Internet threats, the other using Web services to extend the enterprise and make it easy for trusted partners to get in. "We're walking fine lines in trying to work through all these issues," he says.

For Sigma-Aldrich, with its offices in 34 countries each trying to build a business geared to the geography it represents, globalization is front and center in Web development efforts. "The challenge is to give ownership to them appropriately, while locking down certain features," Johnson says.

Translations are problematic. While many of its customers speak English as a sort of universal language, they are uneasy about conducting financial transactions online using a language with which they aren't completely comfortable. To date, the company has 30 local Web "portlets" that support 26 of its worldwide offices and 18 languages. But the job is formidable, because the company does business in 160 countries and must support 16-bit character sets like those used in the Arabic, Greek, Israeli, Japanese, Korean, Russian and other languages.

Sigma-Aldrich also is wrestling with online customer interaction, looking at technologies including instant messaging and chat. The company is also looking at a technology called co-browsing, in which a customer service representative could take control of a user's browser and help him surf through a site, for example. Johnson calls interactive customer support the next frontier. "It's not an area where we've had tremendous achievement, but I think we will," he says.

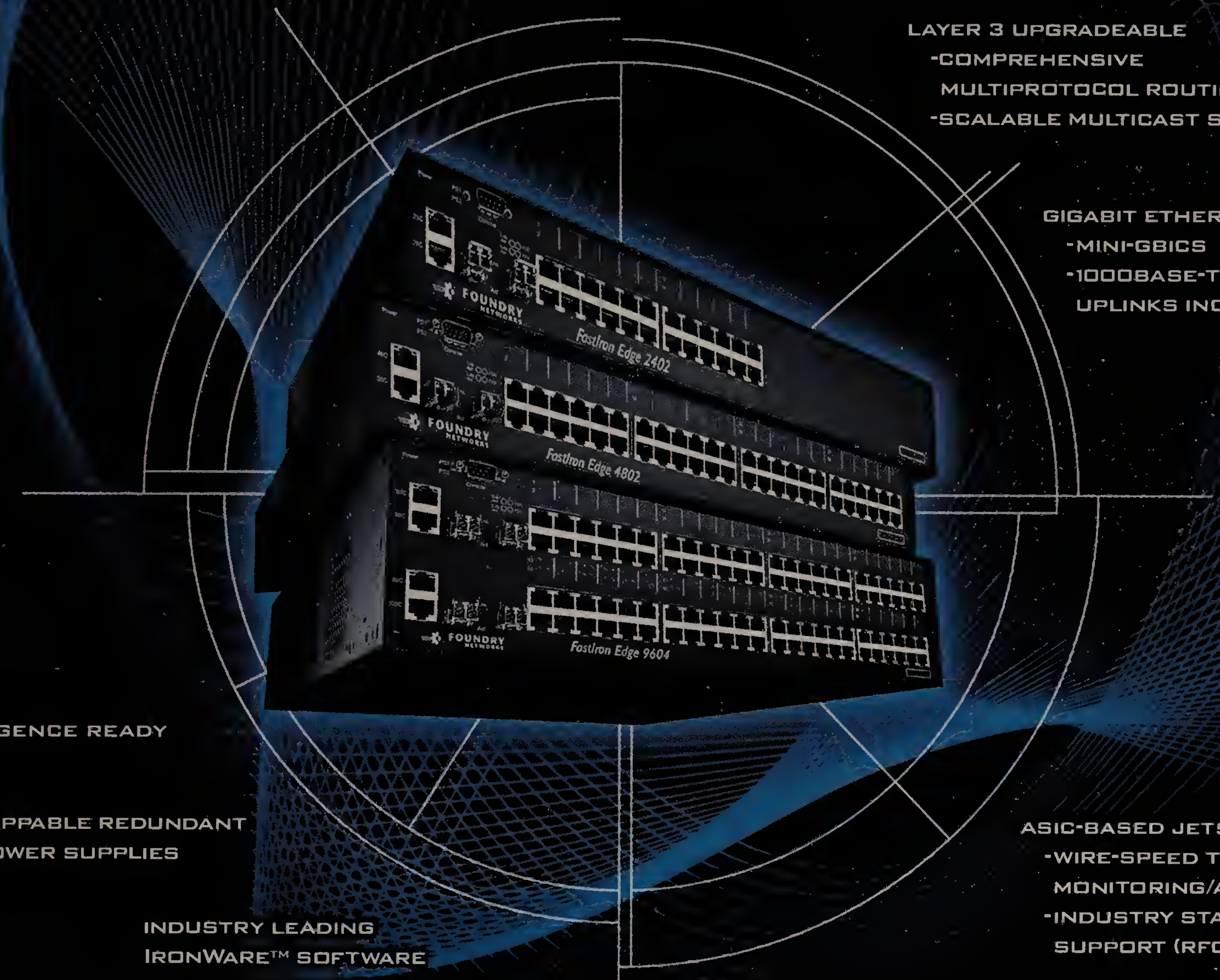
Like Ford Credit and Staples, Sigma-Aldrich has no choice but to continually enhance its online integration efforts. "When you're running 30% of your orders through the Web, it's no longer a project," Blazevich says. "It's part of the business."

Desmond is president of Paul Desmond Editorial Services (www.pdedit.com), an IT publishing firm in Framingham, Mass.

Web work, year by year

Going from the basic to the sophisticated has meant a series of application launches and development work for e-commerce pioneers Ford Credit, Sigma-Aldrich and Staples.com.

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Ford Credit	• R&D for a Java version of CreditNet.		• Internet Account Access, an HTML client for consumers to access and update account details.	• CreditWeb, a Java-based client for dealers to submit credit applications and view credit decisions; Internet Credit Application, an HTML client for consumers to apply for financing.	• GenericWeb, which standardized on an XML-like interface for CreditWeb and Internet Credit Application processing.	• CreditWeb 2, a J2EE- and HTML-based system for dealers.		• Pinnacle Loan Origination, a J2EE- and HTML-based system, for branches to process loans.	• XNet, a Web services, standards-based interface for handling credit application processing, for CreditWeb 2 and the joint venture RouteOne.	• XNet for dealer service providers and other credit application processing systems; Pinnacle Account Servicing, for service centers to handle customer servicing functionality.
Sigma-Aldrich		• Initial site, mainly for brochureware and an e-mail order form.		• Internet strategy team; information-based site with e-commerce capabilities.	• SAP R3 integration via Haht Commerce software.	• Customer adoption and conversion program; European Internet team.	• First B2B integration; European SAP connections; site update for more scientific data, localization, stability and security.	• FileNet Web content management system for distributed owner-ship/centralized content control; order translations in seven languages.	• Context-sensitive product displays; chemical structure search tool; localization for 28 countries, 18 languages.	
Staples				• Staples.com Version 1.0.	• Integration with call center and inventory systems, for real-time check of inventory at order placement and automated order entry; StaplesLink.com, procurement management and custom catalogs for corporations.	• StaplesLink.com integration with major e-procurement systems.	• Staples.com integration with store point-of-sale systems, providing seamless multi-channel experience via in-store kiosks.		• WebSphere-based StaplesLink.com 4.0, providing ease-of-use features and order management functionality; "Easy Reorder" and "Help Me Decide" tools for Staples.com.	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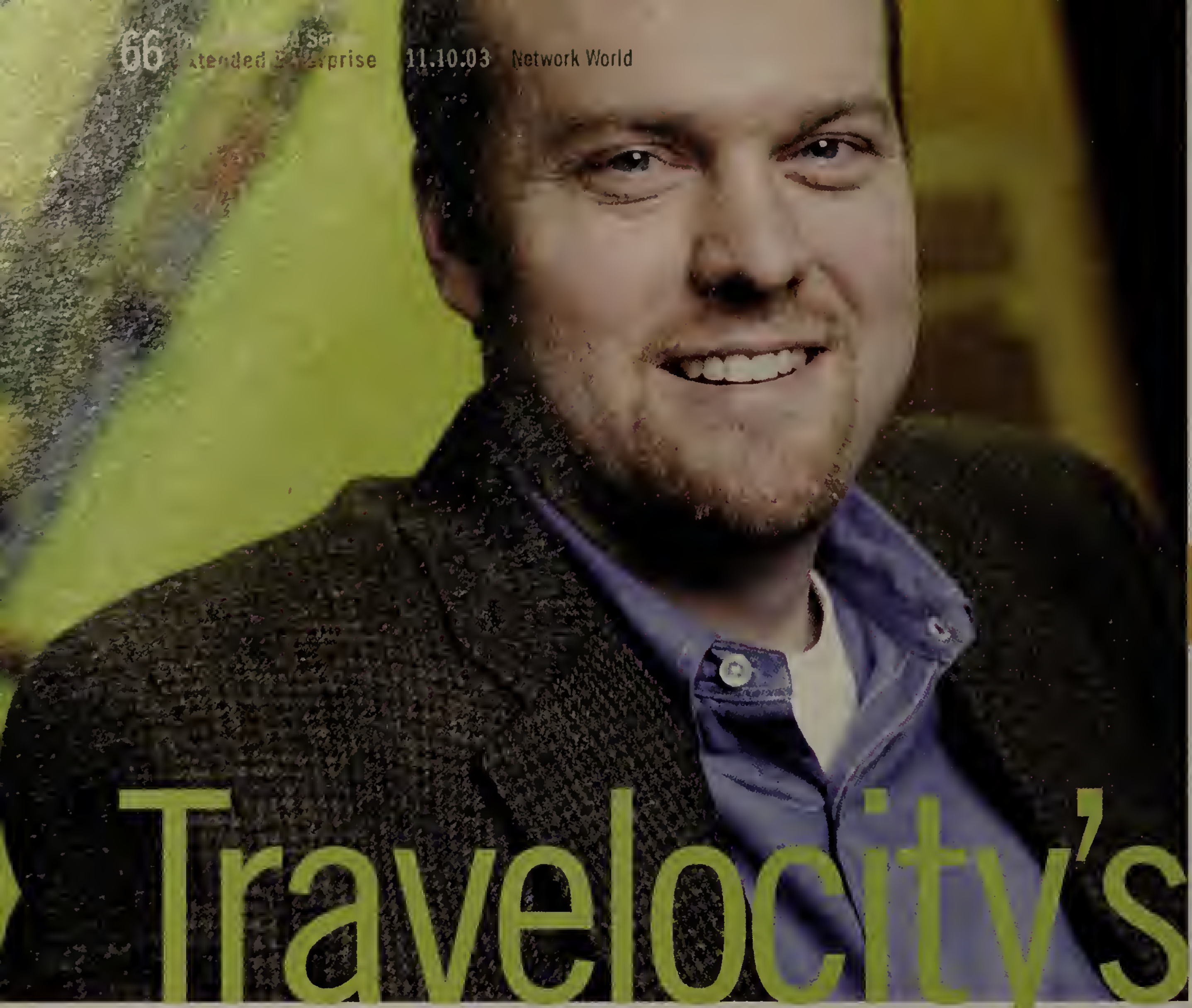

LISA MEANS

[The open source price is right for Travelocity CTO Barry Vandevier.]

Travelocity's flight to open systems

CTO Barry Vandevier trusts Linux to keep Travelocity's renowned extended enterprise aloft.

The extended enterprise concept is as old as networking itself and as young as e-commerce. Few companies typify that old/young dichotomy better than Travelocity, the Internet child of Sabre Holdings — granddaddy of extended enterprises.

In Travelocity's seven-plus years of operation, it expertly has piloted the e-business skies, serving millions of customers with connections to thousands of hoteliers, airlines, car rental agencies and other travel suppliers.

Its Merchant Program, just one instance of its e-business architecture, already represents more than 7,500 hotels one year after its launch. With this program, which increased by 3,000 partners from June to September 2003 alone, Travelocity behaves like a hotelier's own Web site. Via exclusive contracts negotiated between Travelocity and the hoteliers, the site taps into the hoteliers' central reservation systems (CRS) and carts out the lowest rates and real-time availability. This is in addition to the 55,000 hotels that Travelocity sells via the Sabre system (the same data accessible by all travel agencies using Sabre).

CTO Barry Vandevier, one of Travelocity's early site developers and a member of Sabre's IT team before that, became CTO in October 2002. He describes his passion for open source tools and shares his thinking on Web services, security and site management in an interview with Julie Bort, executive editor for Network World's Signature Series.

From an IT standpoint, describe your relationship with Sabre.

We have separate IT organizations. We focus on the Travelocity site, Sabre on the infrastructure, but we collaborate heavily on a constant basis building out our projects. For instance, the Hotel Merchant product that [Travelocity has], we built together. The Total Trip product that we released in June, where we are packaging our hotel and air products together, was a combined product between Travelocity and Sabre.

Tell me a bit about Travelocity's architecture.

We are migrating to a new architecture, from our original system built on C++, running on Unix SGI. We are migrating to an open source Java platform running on Linux. Total Trip is running on the new architecture, as is some other functionality. We'll continue migrating over the next several months [for completion] next year.

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some of our older products is great, but from a total-cost-of-ownership perspective, Linux was just a very good ROI.

We're a big fan of open source, from total cost of ownership and from the sharing/collaboration [creation processes], using tools developed by other people and having [easy access] to other people who have experience with them. We're using Tomcat, Struts, Linux, JUnit, as well as some off-the-shelf products, like [IBM's] Rational Rose and [JetBrains'] IntelliJ, for our [Java] development environment (see graphic, below).

Tell me about Travelocity's Merchant Program. What infrastructure was needed to enable direct connectivity to the hoteliers' CRS?

We took advantage of existing Sabre connectivity to 55,000 hotels' CRS to really improve our suppliers' ability to update rates and inventories on our system. We partnered with Sabre and built interfaces to [Sabre's] Merchant platform through XML services.

We are migrating to an open source Java platform running on Linux . . . Linux was just a very good ROI.

You say XML services. You don't consider the connectivity between the Travelocity and Sabre Merchant systems to be Web services?

I would actually. But because that was built a while back, we are working on a much more robust gateway, right now, with Sabre. This is Sabre's Universal Services Gateway, which gives us access to Sabre capabilities via Web services.

So the current, XML services don't have all the latest fancy things, like UDDI, etc., I would guess?

That is correct.

What then is your opinion of Web services?

Web services are a big key for us for the future, to improve flexibility and changes between [us and our] partners. Web services will enhance our suppliers' connectivity, so making changes or adding content will be much faster for both parties.

What advice can you offer for security?

Security has got to be top of the mind. We have a full-time security officer. We also work a lot with Sabre security, and we involve security at the beginning of every one of our projects. We walk through a set of security questions so that we get our technical leads thinking about the subject. Any profile or customer data has to be heavily encrypted. Anything [sensitive] we store in any servers or database has to be encrypted. We never send, for instance, credit card data through the customer's [user interface], we only do the last four digits.

We do security awareness training. HTTPS is readily available, Triple-DES or PGP when we are transferring files — there are a lot of very secure capabilities out there, and we make sure our technical leads are trained and thinking about them.

One big issue for extended enterprises is finger-pointing — blaming the other folks when problems occur. What is the best way to handle trouble ticketing over multiple systems?

It is more than trouble ticketing. This is another area that you've got to think about from the beginning: Make sure your product is well-instrumented with monitoring. If you don't, that's where the finger-pointing comes up. [Monitor] all the way down to the connectivity, the time it takes to receive responses. Record in a consistent manner the right, detailed data to flag an issue. We have people dedicated to building out monitoring for our systems. We built [code that moves] any error messages we record to a centralized location that we can then monitor. Flags [are sent] either via paging, or some of our hosting services will flag via Computer Associates' Unicenter. We are using some open source monitoring products like Java Message Service. One of the complexities with Total Trip is that we are connecting multiple partners at once and packaging that for our customers. That magnifies the connectivity and forces you to, upfront, make sure you've got good instrumentation.

How do you test?

Before we launch any product we have multiple test systems. We use JUnit, and require unit tests on all of our new architecture. [This involves testing code in small units while it is being developed.] Before [new architecture] ever goes to production, we use products like [Qwest Software's] JProbe and [Mercury Interactive's] LoadRunner, so we can look for appropriate load, any issues that may be hogging up the CPU or memory. Once it's done over there, it goes into certification testing before it launches into production. We do continuous integration testing — we use an open source product called CruiseControl. ■

Massive is the word
that best describes Travelocity's reach:

- Travelocity is the **seventh-largest** U.S. travel agency in gross travel bookings.
- Since launching, Travelocity has attracted **more than 40 million members** and sold more than 23 million airline tickets to 11 million individuals.
- Each night Travelocity searches more than 220,000 city pairs among its databases to find fare reductions. It sends an average of **170,000 "FareWatcher" e-mails daily** to notify customers of a fare reduction between specified routes.
- On an average day, Travelocity's reservations page receives **more than 11 million page views.** Its customer service centers handle more than 14,000 phone calls and 4,000 e-mails.
- Travelocity is the back-end system used for the travel services offered by **AOL, Yahoo and US Airways.**
- Travelocity counts **10 million subscribers** for its online newsletters — almost nine times the daily circulation of *The New York Times.*

Travelocity CTO Barry Vandevier

is a big fan of open source development tools. Here are a few of the indispensable tools for his team.

Open source tool	Function
Concurrent Version Systems	A version-control system.
CruiseControl	A tool for continuous integration of code changes into the application so developers can test frequently.
Java Message Service	A Java-based messaging application.
JUnit	A framework for unit testing in Java.
Linux	An operating system.
Struts	A framework for building the user interface in Java.
Tomcat	A Java application server.

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Despite technology barriers, the real-time enterprise is the next milestone for today's extended enterprise.

BY JULIE BORT

[**Tom Ballard,** **CTO of Hoover's Online, sees real time in the big e-business picture.**]

MICHAEL O'BRIEN

How far can we go?

Many network executives and industry analysts clearly can see e-business' next milestone. Some call it the "real-time enterprise," a business structure that allows the automatic routing of information to the right person at the right time — instantaneously if required. Hand in hand with that, they foresee how the network would become a commodity utility.

This would free up the network's creators and guardians to focus on solving far more difficult technical problems than the reliable transport, storage and access of data. One such problem is true collaboration. Despite rosy projections for adoption of real-time collaborative technologies, automating interactions among human beings is an enormous technical challenge, researchers say. Yet this technology will be critical for the real-time enterprise and beyond.

As for the shape of e-business infrastructure in that beyond, it remains anyone's guess — although pundits prophesize that this commoditized real-time network will lead us to amazing global possibilities. The most prescient technology navigators can see beyond even this, to a sci-fi future in which tiny, honeycomb-like independent organizations, glued together seamlessly by the network, compose the corporate world. Others contend the instantaneous data network will affect even more than that by influencing geopolitical interactions. But wherever the destination, lead us it will — and quickly, too. We have already started down the path.

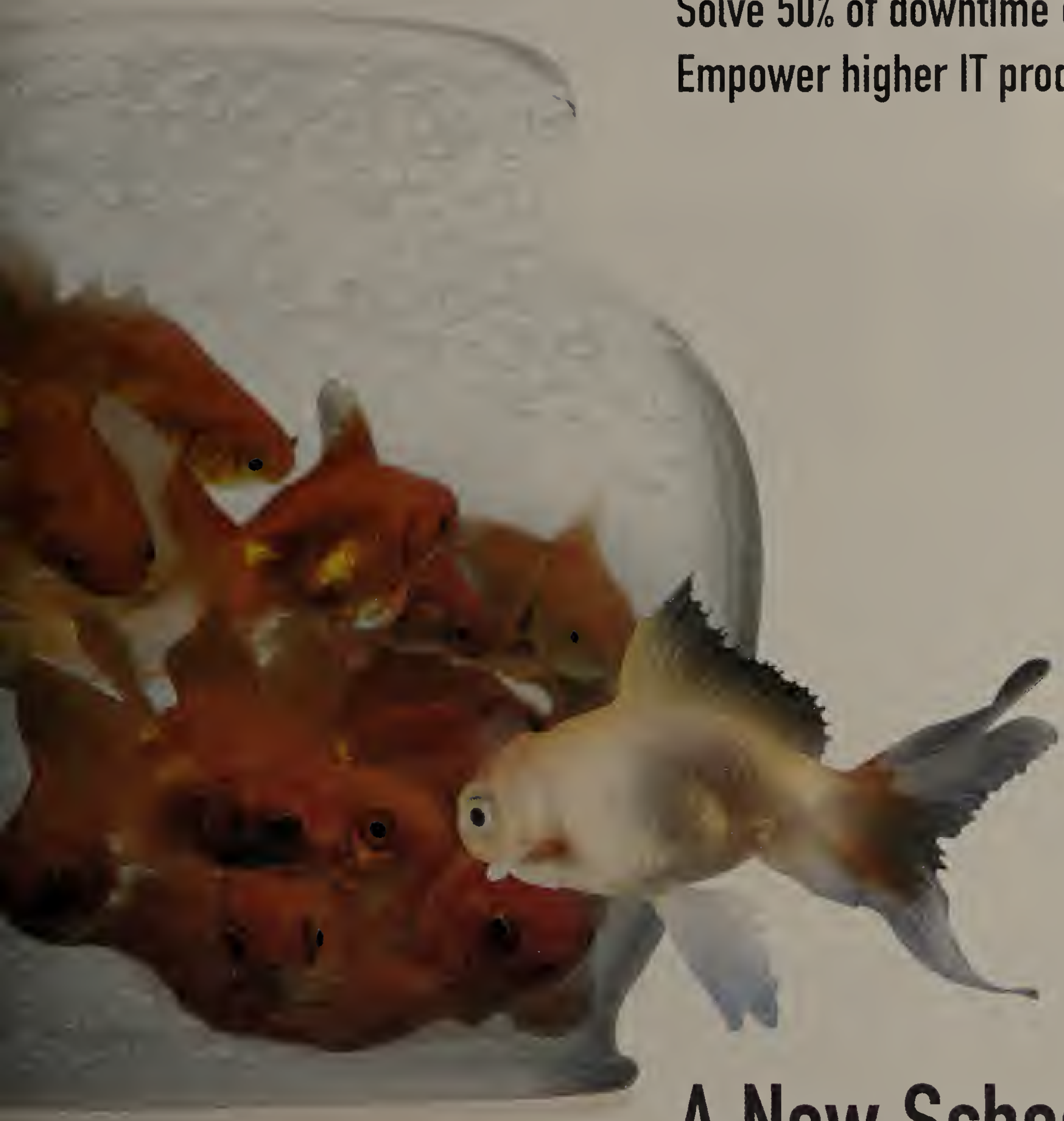
Extended-enterprise forerunners are using real-time e-business functions now (see story, page 72). But bringing real-time to the mainstream requires mass adoption of a stable, open systems-based network. Some liken this to turning the network into a commodity-like service and focusing higher up the Open Systems Interconnection stack, says Robert Handler, vice president of enterprise planning and architecture strategies at Meta Group.

He notes that this process has begun: For instance, network people rarely concentrate on which network interface card is best, nor do they fret over routers and protocols. Rather, they now concern themselves with issues such as which application server is best, he says. Eventually open standards among applications will make the entire stack a non-issue, he adds.

BUSINESS LAUNDRY LIST

Business processes across partner networks also must be standardized before the real-time enterprise can take root, says Thomas Koulopoulos, president and co-founder of market research firm Delphi Group.

See Barriers, page 72



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Barriers

Continued from page 70

"I may have all the networking I need to initiate a process, but no way to control [the transaction] once it leaves my business. I'm at the mercy of my partner's processes," he says. In other words, no matter how many monitoring or workflow triggers you've built into your application, if a partner prints the transaction record to paper for handling, then your ability to automate processes becomes irrelevant.

Users agree that they must rid the network of the last vestiges of yesterday's model — proprietary technology — to reach the next e-business milestone.

"Real-time info sharing is imperative, but implementing it is all over the board," says Tom Ballard, CTO of financial site Hoover's Online in Austin, Texas. In the absence of standards, real-time implementations tend to be vendor-dependent, he notes. "That's a big stumbling block. My vision is a more open architecture — more driven by the technology people that understand the business needs," he says.

Portability, identity management, collaboration and business process management would top a laundry list of such business needs.

Portability is a sticking point because the real-time extended enterprise will need to complete transactions regardless of device or location, says Patrick Gannon, CEO of the Organization for the Advancement of Structured Information Standards (OASIS), an XML standards body. "If you're trying to link into all distribution networks, you'll be using a variety of devices," he says. "There are technologies available to do this — the question is, how do they go about integrating?" Gannon says the answer is open systems. OASIS approved the first version of a portability standard, called Web Services for Remote Portlets (WSRP), in August. WSRP creates plug and play for devices accessing portals (or Web applications that conduct transactions by tapping into disparate sources).

But porting the transactional datastream to any device or location leads directly to an identity management problem. And that scares users.

"On the whole, identity management — being able to go into another office, plug in and be on the network — is a great idea, but a big security challenge. There are no real standards for knowing if that network is secure. I don't see that being resolved," Ballard says.

Of course, groups such as the Liberty Alliance are trying, and some companies are building their own identity management systems. Nevertheless, identity management remains a hurdle for real-time extended enterprises.

NO EXCEPTIONS

Collaboration also must be a doorway to the next-generation e-business, but for now is more of a wall. Some users do have success stories to share, but for the most part implementations are limited in scope — custom-built for a particular project, for example — or in sophistication. Web meetings and instant messaging are seeing an uptake in corporations, but these collaboration types are fairly simple.

"We're already doing as much [collaboration] as we can. I haven't seen anything out there that's that savvy — we've used NetMeetings and Web seminars. But the tools have got to be faster, and there's got to be an investment in bandwidth across the U.S.," says Michael Newcity, e-commerce manager at ABF Freight System in Fort Smith, Ark., adding that collaboration also poses cultural issues. "I'm not sure human beings are really ready to work like that — it's kind of a solution chasing a problem. We're slowly getting used to working without paper. . . . Maybe the next generation of people can do more with collaboration."

Koulopoulos agrees. "A lot of us will die off before we figure out what collaboration will really be," he says.

Collaborative workflow today is frighteningly inflexible, which makes it a major impediment to true supply-chain automation, says Mark Klein, a professor at the Center for eBusiness at the Massachusetts Institute of Technology in Cambridge.

"Supply-chain technology now is good for well-defined, consistent processes," Klein says. As companies become more service oriented, more exceptions occur, and the inflexible collaboration technology becomes problematic, he says. "If things go a little bit different from what the system was designed to do, customers can fall into a black hole — and get incredibly angry," he says.

Moreover, because automated systems have less human oversight than manual processes, bad exception-handling might not be detected quickly enough. If the error occurs during a financial process, then "you may not know that a lot of money is missing for quite a long time," Klein says.

The classic illustration is Nike's implementation of supply-chain software from i2 Technologies in 2001. Forecasting systems misled factories, creating both inventory excesses and shortages. (See story, www.nwfusion.com, DocFinder: 8430.)

Whether designing a product or conducting Web meetings, success heavily depends on people's willingness to share information and populate the collaborative database. It also depends on the ability to improve efficiency. Yet Klein notes that automating a group process won't necessarily boost efficiency. Groups often spend eons on a new product design, only to decide that the original concept as drawn was best. Investing in collaboration tools to encourage more such group work — or even to help automate such an inefficient work system — isn't necessarily a smart move.

Solving such dilemmas will require the maturing of business-process management, Handler contends. This type of software monitors for "major types of exceptions" and ensures they are dealt with properly, he says (see story, DocFinder: 8422).

IMAGINING A NEW WORLD ORDER

If past performance is any indication of future success, the next e-business milestone will arrive within two to three years. But how far can we go after that? Some say that once the commodity, always-on, real-time collaborative network is in place, we've got the makings of a brand new corporate structure.

"The next ultimate from where we stand is a component-based architecture for building businesses. We're going to become so good at that that [a corporation] will really be a bunch of smaller corporations glued together — very highly networked, very integrated. The network works so well, you don't know a network is in place," Koulopoulos says.

This honeycomb corporation then will tackle crossing the language and cultural barriers to build international e-businesses. And from there we step into the realm of science fiction.

"Global connectivity is going to impact us in ways we can't even imagine," Handler says.

Oh, but we can, users say.

"We can all just imagine fiber to every home in every industrial nation in the world, and we've all got instant messaging and everything else. We'd have some serious issues about government regulations and invasion of privacy, a whole slew of security issues. But I firmly believe there's a next cool thing," Newcity says.

So maybe the ultimate evolution of e-business is still bit fuzzy. Yet, when it comes to the extended enterprise, much of the future is visible today — for those who care to look beyond the barriers. ■

Real-life real time

Some users already are moving beyond today's extended enterprise to tomorrow's real-time one.

Examples abound of cutting-edge extended enterprises already testing real-time — meaning near-instantaneous — automation.

Travelocity, for instance, taps into the central reservation systems of thousands of hoteliers for real-time availability and pricing data (see related story, page 66).

Michael Newcity, e-commerce manager, clearly envisions ABF Freight as a real-time enterprise.

Meanwhile, ABF Freight System, our 2001 E-comm Innovator Award winner, last year implemented several real-time applications, among them a shipment progress notification system (see story, www.nwfusion.com, DocFinder: 8425). Drivers use Nextel phones equipped with microbrowsers. Via a custom wireless application, they submit progress information while on the road, rather than at day's end.

Not only does this let customers follow shipments more closely, it helps ABF on the outbound planning side "now [that] we have that info five hours earlier," says Michael Newcity, e-commerce manager at the Fort Smith, Ark., company. ABF planners can alter routes and consolidate shipments during the day, on the fly, thanks to up-to-the-minute data on driver locations and loads.

Financial site Hoover's Online also relies on real-time sales operations. Publication of financial stories must be real time, but back-end operations are following suit, says Tom Ballard, CTO at the Austin, Texas, company. When an interested customer fills out Hoover's online subscription form, a mouse click sends the form to the salesforce automation system, where it triggers an alert and follow-up tracking. "If you are interested enough to fill out the form, you are interested that moment, not the next day," Ballard say. "Taking a lead instantly off the Web site and responding to that lead within minutes — that's our life."

Thomas Koulopoulos, president and co-founder of market research firm Delphi Group, calls endeavors such as these "always-on e-business." He compares the instantaneous real-time enterprise with indoor plumbing: "When you need to get a transaction done, you can — the always-on e-business is always there."

— Julie Bort

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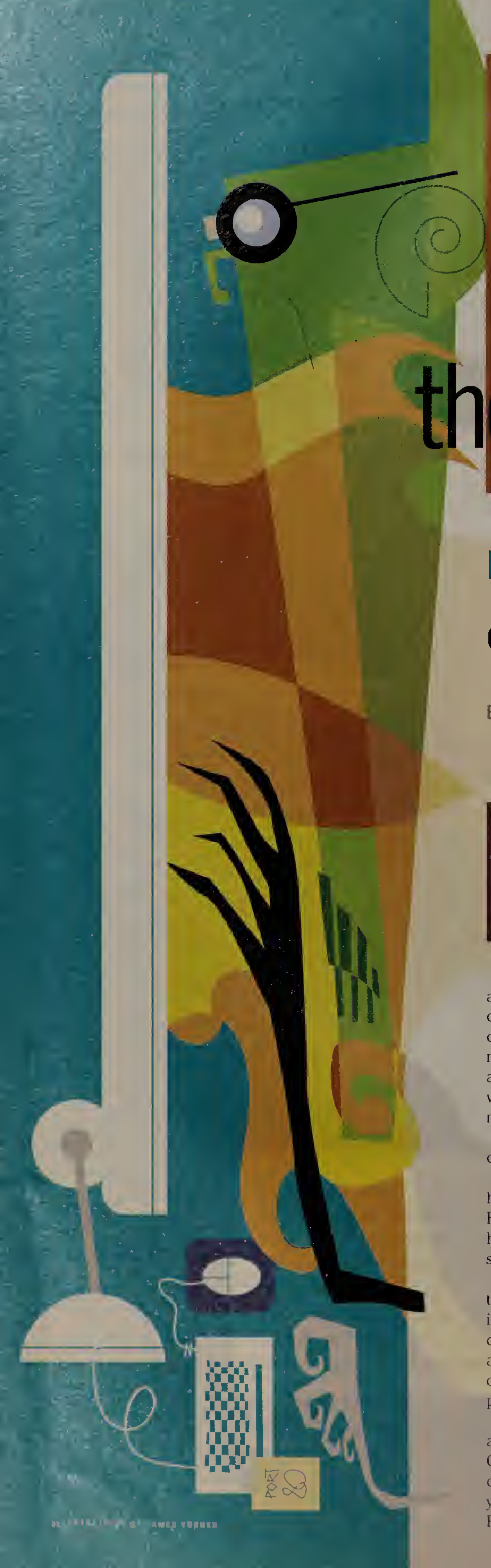


ILLUSTRATION BY JAMES TURNER

Crankin' up the heat

New Web application firewalls give you the chance to burn Port 80 hackers.

BY BETH SCHULTZ

Industry statistics show that 80% of malicious attacks target Port 80, the Web traffic pass-through. Why, then, does the onus for Web application protection still fall largely on network-layer devices? Web applications clearly need special security.

Firewalls specifically designed to protect Web applications would recognize a hacker's attempt to create a buffer overflow, to inject false SQL or system commands in program variables, or to otherwise manipulate the datastream for ill purposes. Web application firewalls see the breaches that a network-layer firewall (or intrusion-detection system) is not capable of detecting (see chart, page 76).

Security experts have begun to call the Web application firewall a must-have.

"I would never deploy a Web application today if I haven't deployed a Web application firewall," says Ravi Ganesan, vice chairman of NSD Security, which helps user organizations build secure Web infrastructures.

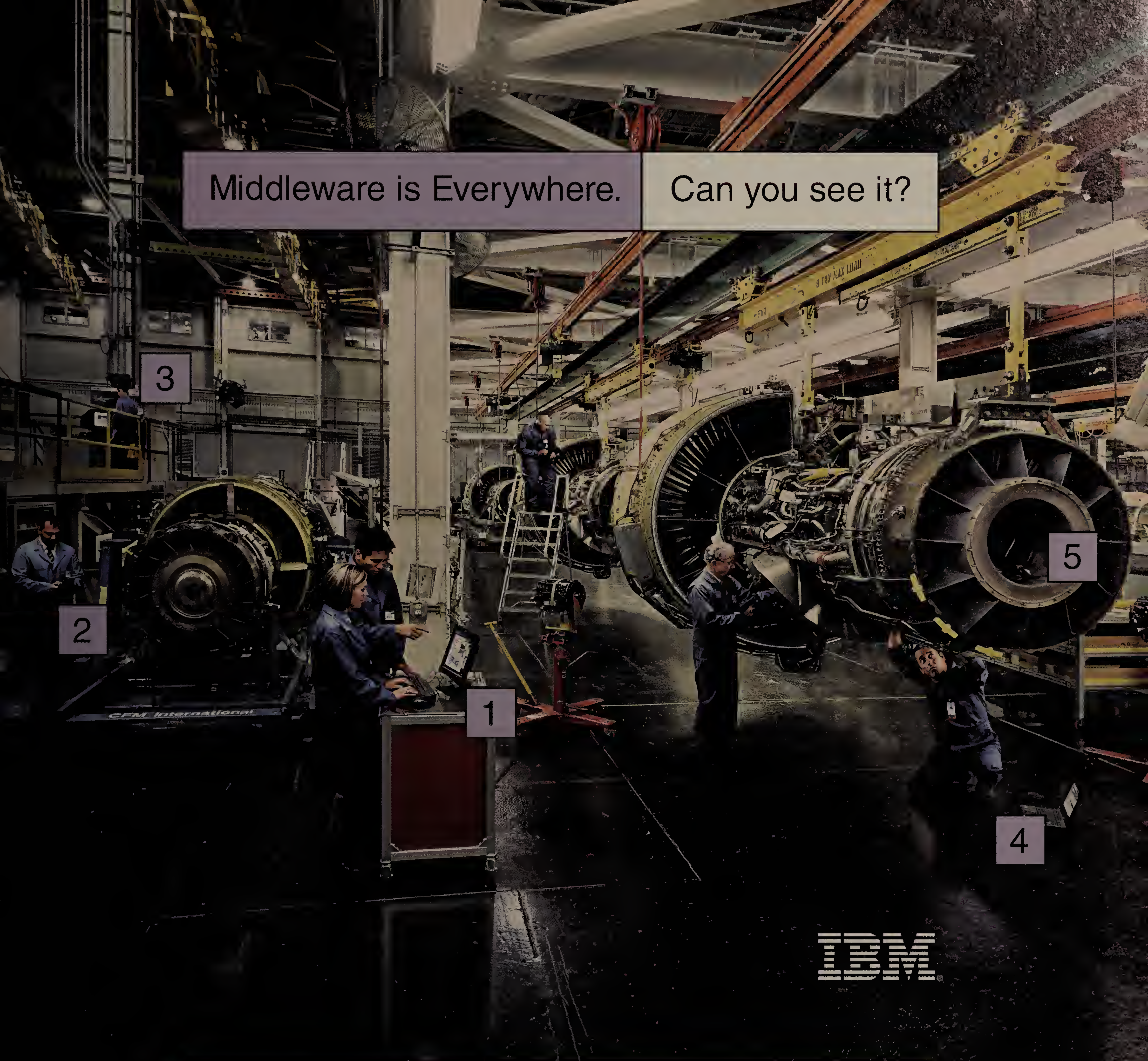
Training Web developers to build secure applications and to conduct initial and periodic vulnerability tests are musts, but don't suffice. Ganesan equates doing those things but not also deploying a Web application firewall to calling Windows or other operating system secure and throwing out the perimeter firewall. "You'd be crazy," he says.

Ed McNachtan, program manager with the Family and Children First (FCF) office serving Montgomery County, Ohio, can testify to the benefits of Web application firewalls. He discovered them early — four years ago, when FCF used Health Insurance Portability and Accountability Act (HIPAA) draft documents to perform a Gap Analysis of the security architecture it planned to use for interagency communications via the Web. "We found our security plan failed around Web applications, and we needed to make reasonable efforts to block that hole," McNachtan says.

He is using AppShield, a software-based Web application firewall from start-up Sanctum, to protect two particularly complex and politically touchy applications that have taken years to develop. The first, in pilot tests now, is a family violence cross-jurisdictional database application. The second is a collaborative case-management application that will go into pilot tests by year-end. "We have privileged and confidential information that we have to protect, plus HIPAA rules and guidelines to follow," McNachtan says. "I'm married to AppShield. It does a great job."

Other early users likewise are enamored with their Web application firewalls. Speaking of the APS-100 appliance from Teros, another start-up, one user, who asked not to be named, says, "The cool thing is, it actually found a problem with the application itself — the way we were passing URL strings. It debugged our application!"

This network design engineer, who is working on an outsourced state Medicaid claims-processing application, considers the use of a Web application



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firewall a competitive advantage. "The need to have a [Medicaid claims-processing] application that works is half the story. The other half is that it's secure and reliable, and the Web application firewall is one of the pieces telling that part. This is going to make a huge impact for us [in winning business]," he says.

Other users also see the Web application firewall as a tool for winning business. "The confidence we get having the Web application firewall when a potential customer comes in — we can really go to the bargaining table," says Todd Bowersox, Web operations manager at Agile Software, a product life-cycle management vendor in San Jose.

Having a Web application firewall rates big with potential customers in the systems audits Agile undergoes during its sales cycle, Bowersox says. Audits of vendor systems are common among U.S. Food and Drug Administration-regulated medical device manufacturers, one of Agile's target customer bases, he says. "The value that the Teros firewall adds is immeasurable," he says.

Besides a polished image, Agile also gains protection for its Web site and some internal Web applications. A consultant presentation on Port 80 vulnerabilities "lit the flame and got us thinking about and looking into Web application firewalls," Bowersox says. "We didn't want to get caught with our pants down, especially with some of our clients coming in and asking, 'What are you doing about security?'"

TECHNOLOGY SPARKS

Web application firewall vendors are divided into two camps: software and hardware. Software vendors include eEye Digital Security, KaVaDo, MultiNet, Sanctum, Turillion Software and webScurity. Hardware vendors include MagniFire WebSystems, Permeo, Teros and Whale Communications. (For product details, see www.nwfusion.com, DocFinder: 8431.)

Thomas Powell, a Web developer who has tested Web application firewalls for the Network World Global Test Alliance, says software-based Web application firewalls are a good choice for those with only one or two servers. Proximity might be an advantage because a software product would reside on the same Web server as the applications it's protecting, Powell says. Software-based products are also relatively inexpensive — with freeware versions even available.

But a hardened Web application firewall becomes almost mandatory for large organizations, he says, citing KaVaDo's InterDo and Sanctum's AppShield as possible exceptions. In Powell's August test of six software-based Web application firewalls, AppShield won our World Class award for its dynamic policy generation and strong default configuration (www.nwfusion.com, DocFinder: 8421). InterDo came in a strong second because of its "extreme flexibility." Each stood out among the rest "for their ability to defend against attacks." (Powell, who is CEO of Web development firm PINT in San Francisco, will test hardware-based Web application firewalls early next year.)

Besides choosing between hardware and software, users investigating Web application firewalls have to decide whether they want to use whitelisting or blacklisting.

Powell says he favors the more-sophisticated whitelisting approach of mapping an application to determine what requests and inputs are allowable, and then blocking everything else. But he cautions that whitelisting products can require fine-tuning to get that application map correct. "The challenge [with whitelisting] is, unless the site is very well-constructed, it's not possible to have a perfect idea of the application," he says. "If a site is poorly developed, then there's the potential for false positives."

Like anti-virus software, blacklisting products look for common attack signatures and, if found, either warn security managers or block the user. One downside of blacklisting is that unless the signature list is 100% up to date, bad queries can get through, Powell says. Another is vendor lock-in, he notes. Because those signature files need regular updating, blacklisting tends to keep users engaged with one Web application firewall vendor. Powell recommends limiting blacklisting use to instances where false positives must be avoided.

IGNITING THE MARKET

Early users of whitelisting firewalls say that the application-learning process hasn't been perfect. But users interviewed for this story say their vendors excel at problem resolution and customer service — a start-up's fortes. In fact, while Web applications themselves are hardly new, their growing importance has created a hotbed of start-up activity. No fewer than two-dozen known start-ups are addressing the Web application protection problem.

Web application firewalls at work

Web application firewalls are tuned to stop hackers intent on exploiting Web application vulnerabilities. The attacks described here would be sensed by a Web application firewall, but typically not by a traditional security device.

Attacks and exploits	Description	User impact
Unvalidated parameters	Malicious or erroneous client-side data is accepted without validation.	Hacker can hijack client accounts, steal data and obtain private information.
Command and SQL injection	Web application passes SQL commands to back-end databases.	Hacker can trick the database into dumping all account information.
Buffer overflows	Inject and execute shell code by overflowing buffers.	Hacker can crash the server or take complete control, as in the cases of the Code Red and Nimda attacks.
Cross-site scripting	Breaks trust relationship between client and server.	Customer credentials and information can be compromised and their identities stolen.
Forceful browsing	Client accesses unauthorized and unadvertised URLs.	Hacker can get access to root directory or other off-limit areas.

SOURCE: TEROS

Of course, established network vendors aren't letting newcomers walk into this market unchallenged. Check Point, Cisco, NetScreen Technologies, Nokia and Symantec are among the security vendors enhancing their platforms with more intelligent assessment of application traffic. Meanwhile, F5 Networks, Nortel and Radware are claiming Web application security as a function of their content switches.

But there's also a whole crop of other start-ups crafting more multipurpose platforms of which Web application protection is but one function. Vendors of this ilk include Neoteris and NetContinuum. The idea of imbuing familiar security devices with application-layer protection has its user appeal.

INFO1, the fourth largest mortgage credit reporting provider in the U.S., plans to use Check Point Next Generation with Application Intelligence for Web application protection, says Jim Noble, director of network and security at the Norcross, Ga., company. INFO1 began offering Web access to credit reports four years ago. "We started using Check Point prior to September 1999 to protect our networks and systems," he says, "and that's one of the reasons we're going with AI today. It's the next functional upgrade."

Noble says he's very comfortable with the enhanced network-layer firewall instead of a purpose-built Web application firewall. "Our Web is fairly well-protected, and I'm confident that we've mitigated 98% to 99% of risks," he says. "Is it worth our energy to get the last 1%? No, not in a business sense."

No matter which platform choice they make, extended enterprises must address the question of Web application protection, and soon, security experts summarize. "You've got to have a Web application firewall," says Richard Stiennon, an analyst at Gartner. "New e-commerce services will just be too vulnerable without something like that."

And most industry watchers say cost shouldn't be an prohibitor for large corporations. "You're probably looking at a five-figure investment [for a hardened Web application firewall], so there's no reason not to have something," says Eric Ogren, an analyst at The Yankee Group. Yankee recommends doubling up on your Web application firewalls for high availability, placing an investment at about $50,000, or $25,000 per firewall.

"Considering we're talking about devices meant to secure your way of doing business, it's easy to justify a $25,000 investment," Stiennon says. "My advice is: Buy a Web application-specific firewall today and install it in front of all your Web servers as soon as you can." ■

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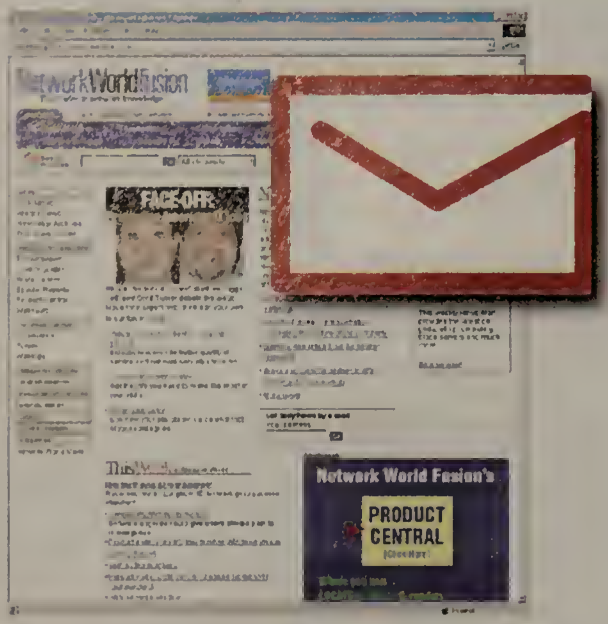

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Jason Kennedy, systems management analyst with Best Buy Canada, yearns for the day when he can monitor e-business apps from a single console.

Making application performance a non-issue

STUART McCALL

Possibilities for managing application performance have increased exponentially. But users remain wary.

BY DENISE DUBIE

Applications at Best Buy Canada/Future Shop can be so complicated that analyzing performance takes no fewer than eight monitoring tools. Jason Kennedy, a systems management analyst at the electronics retailer's headquarters in Burnaby, B.C., says he needs such a large tool set to ensure the core features of point-of-sale, inventory and other business-critical applications are working efficiently across 130 locations. Kennedy says he hopes to ease his management burden by using HP's OpenView Operations application performance management software, although he has no illusions about that tool belt getting any lighter. "I don't think there could be just one tool for application performance management," Kennedy says. "If someone did manage to build that tool, it would be so complex, it would be impossible to use."

In Best Buy 's case, OpenView Operations will provide a collection and correlation point for data gathered by other OpenView products, a Computer Associates' workflow management product and SNMP traps built into the company's homegrown applications, among other third-party monitoring tools. "If I can efficiently get to one pane of glass by bringing that data together, I can get closer to seeing the performance of the entire service connected to an application," Kennedy says.

UNDERSTAND, THEN CONTROL

Kennedy is tackling one of the more challenging management tasks in networking today: understanding application behavior enough to control it. This isn't a new issue, by any means. But it is one growing in importance as companies continuously intertwine their business processes with those of customers and suppliers.

Users need strong application performance management capabilities to diagnose trouble quickly and eliminate finger-pointing among business partners. This has shifted demand from tools that monitor distinct network components to software that can measure the end-user experience, diagnose the source of performance degradations, and understand and visually map the relationships between applications and the network components that support them.

"Business managers only care if their apps or services are working, not about servers or network devices," says Jasmine Noel, principal with JNoel Associates.

At Virginia Polytechnic Institute and State University in Blacksburg, Brian Jones, manager of network engineering and operations, employs homegrown tools alongside Smarts' InCharge Service Assurance Manager software. He integrates network and availability data with SNMP traps and other information that might be pertinent to application performance.

But as the importance of application management grows at Virginia Tech, Jones says his team will evaluate more commercial options that are open enough to integrate with the tools he uses today. "Streaming video, [voice over IP] and other [quality-of-service] demands make it more necessary than ever to be able to quickly diagnose and resolve issues. We are looking into systems that could serve as one correlation point," he says.

> **"You can't talk seriously** about performance management without knowledge of your technology inventory and how it is changing."
>
> [**Jasmine Noel, principal, JNoel Associates**]

OPTIONS APLENTY

The choices are mind-boggling. Application performance management underpins such lofty technology goals as utility computing, service-level management and distributed Web services. So loads of network and systems management vendors recently have enhanced their products with features that address this need. Integration, automation, root-cause and traffic-analysis features figure prominently in application performance management systems, as do configuration, asset and inventory management capabilities.

Integration helps network managers more quickly bring data from proprietary systems together, and automation removes the manual effort of that and other IT tasks. Root-cause analysis speeds problem diagnosis, telling a network manager, for example, that the reason a sales application is not available is because a router is down. And traffic analysis, when used with auto-discovery tools, can help network managers to see how applications touch network resources and to build a topology map.

"You can't talk seriously about performance management without knowledge of your technology inventory and how it is changing," Noel says.

Network management giants Computer Associates and HP promise new products to help companies track application performance outside the corporate firewall by way of Web services. Both will get to that end at least in part through acquired technology. HP says it will improve its OpenView software suite with Web services management technology it gained with the acquisition of Talking Blocks. The OpenView suite serves as the management software component of HP's larger Adaptive Enterprise initiative.

For its part, CA acquired Adjoin, with the plan to incorporate the start-up's Web services technology into its broader Unicenter platform. Later this year, CA is scheduled to release Unicenter Web Services Distributed Management, which uses agents to discover Web services automatically and monitor service characteristics of Web services transactions.

Start-ups such as Collation, Relicore and Vieo have targeted traffic analysis as the best way to get a sense of how an application performs, while Web-centric companies such as AltaWorks, Dirig Software and Wily Technology incorporate .Net and Java knowledge to help users see how Web-enabled applications behave (see chart, left). In the meantime, traffic management and acceleration vendors argue that their products defy bandwidth constraints and speed application performance, and companies such as start-up Reflectent take the end-user perspective even further by exploring application performance on the desktop.

Despite all the vendor attention, the technology to manage application performance just isn't there yet, contends Kim Ross, CIO of Nielsen Media Research in New York. Ross uses a tool belt of "classic monitoring tools" to track availability, but recently rolled out Collation's Confignia software. He says the software is starting to capture and monitor the many-to-many relationships between applications and network and system components, but still he says more work is needed.

"Missing are tools that let you keep track of the ever-expanding number of data center components and the information that can tell you the relationship between the applications and the components they run on," Ross says.

While management vendors say they hope to fill in those missing pieces, the best approach to application management performance really lies in application development.

As companies push toward Web services, in which they build applications to share with partners and customers, they're finding that legacy applications could be better managed if they were built differently. Using languages such as .Net and Java, developers can tell an application how to inform management software about its performance. If an application is built with management in mind or instrumented to export management data to third-party tools, tracking its performance on LANs, WANs, the Internet and partner and customers networks could get significantly easier, says Stephen Elliot, a senior analyst with IDC.

Best Buy's Kennedy agrees. "The real core applications — point of sale, inventory — we've written ourselves," he says. "Ideally, you build measuring capabilities into the application. Ideally, but not always." ■

Attacking from different angles

Application performance management has clearly become a priority among network and systems management vendors, as this product sampling shows.

	Company	Product
Network management giants: Having mastered (for the most part) fault and availability management, these vendors want to move up to the application layer.	Aprisma	Spectrum Application Manager
	Computer Associates	Unicenter Management suite
	HP	OpenView Operations
	IBM Tivoli	IBM Tivoli Monitoring suite
	Micromuse	Netcool for Applications and Systems Management
	Smarts	InCharge suite
Application experts: Filling a monitoring void previously neglected by the network management giants, these vendors built application behavior intelligence into their products.	BMC Software	Patrol for Application Management
	Compuware	Vantage suite
	Concord Communications	eHealth Application Performance Management
	NetIQ	AppManager Suite
	Mercury Interactive	Application Management suite
	Quest Software	Application Performance Management suite
Web-centric world: By understanding development languages such as Java 2 Platform Enterprise Edition and Microsoft's .Net, these vendors aim to manage the applications where they live — on Web and application servers.	AltaWorks	Panorama
	Dirig Software	Dirig PathFinder
	Precise Software (acquired by Veritas Software)	Veritas i^3
	ProactiveNet	ProactiveNet
	TeaLeaf Technology	RealiTea
	Wily Technology	Introscope
Traffic cops: With software and appliances to identify protocols and accelerate application traffic, these vendors' products find the fastest routes to quicken app performance.	F5 Networks	Big-IP (LAN) and 3-DNS (WAN) suites
	Ipsum Networks	Route Dynamics
	NetScout Systems	nGenius Performance Manager suite
	Packeteer	PacketShaper
	Peribit Networks	Sequence Reduction suite
	RouteScience Technologies	PathControl
Performance start-ups: With new methods on application management emerging constantly, these vendors tackle performance in ways that include traffic analysis, application instrumentation, client-side monitoring and more.	Apparent Networks	AppareNet
	Collation	Confignia
	Entuity	Eye of the Storm
	Quantiva	Quantiva Analysis System
	Reflectent Software	EdgeSight
	Relicore	Clarity
	Troux Technologies	Troux
	Vieo	Adaptive Application Infrastructure Management

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The ultimate Internet

John Patrick, well-respected Internet go-to guy, shares his big-picture look on the shape of business to come and the future of the 'Net.

ILLUSTRATIONS: FEDERICO JORDAN

After decades of growth, we are now about 5% of the way into what the Internet has in store for our business and personal lives. Soon, 1 billion people will be using the 'Net, empowering themselves to get what they want, when they want it, from wherever they are. Expectations for on-demand e-business are expanding by the day.

An on-demand e-business has integrated all its processes so that it presents one face to the customer. Buy it online and return it to the store. Buy it at the store, return it via an online request and then ship to a centralized location.

On-demand e-businesses enable "click here" to initiate a service-call chat session or video window with an actual person. On-demand e-businesses do not have the words "fax this form." They don't pretend to be global businesses and then say to call a toll-free number "9 to 5 Central Standard Time." On-demand e-businesses offer a people-oriented and user-friendly integrated experience for all parties involved — employees on the intranet, suppliers, customers, partners, analysts and prospective constituents.

On-demand e-businesses will not have achieved 24-7 by making everything redundant, but rather will have used autonomic computing capabilities to achieve the effect of redundancy. This effect of redundancy will come from virtualization of resources, and intelligent and automatic sharing of those resources. A fully integrated e-business will gain cost advantage by creating an on-demand operating environment that lets it expand capacity on the fly to meet unexpected needs of customers. Ultimately most on-demand e-businesses will become computing utilities or use one. Few, if any, truly on-demand e-businesses exist at this stage, but the early adopters are beginning to emerge.

E-businesses will be helped a great deal by the continued rapid evolution of the Internet. Each day we get closer to a new phase of the Internet that will make today's version seem primitive. Not only will this next-generation Internet be orders of magnitude faster, but it also will be always on, everywhere, natural, intelligent, easy and trusted.

Fast and reliable connectivity finally is appearing, and the competition to provide it is beginning to heat up. Cable, telecom, satellite and the power grid are each threatening the other, and the result will be more speed, improved service and lower prices. More important than the speed is the always-on connection, which will increase propensities to use online services — and also increase expectations.

The effect of Wi-Fi is bigger than coffee shops and train stations. With Wi-Fi chips in handheld devices and the rapid adoption of voice over IP based on Session Initiation Protocol, the Internet becomes everywhere, and a voice conversation becomes just one of the many things you can do while connected. Long-distance will no longer mean anything. Wi-Fi soon will be as secure and as fast as today's wired Ethernet. Advanced antenna and radio technologies will ensure ubiquity. With more people always on and having adequate bandwidth, information-oriented e-businesses will lead the charge for the re-emergence of the application service provider.

Web services are enabling a global-application Web, where any and all applications can be linked together seamlessly. Not only will you be able to use points to pay for hotel reservations online, but also to designate from a check box on that same hotel Web page the airline from whose frequent-flier program the points should be deducted.

It soon will be clear that Linux is not about "free." It is about achieving scalability, reliability and security. The world will remain heterogeneous, but the underlying operating systems need to be open so that all can see how they work and contribute to them. The open source model also will mean more rapid innovation.

Security will no longer be the biggest issue — authentication will. The need is urgent. People have an unmanageable number of IDs and passwords. Digital certificates will let people, computers, handhelds and applications interact securely in a distributed Web of trust. With a redesign of e-mail protocols, we also will gain confidence and control over those with whom we communicate. Corporations will share knowledge internally and externally through syndicated Weblogs.

The potential of the Internet is much greater than meets the eye. As the Internet evolves, it will become so pervasive, reliable and transparent that we will take it for granted. It will be part of our lives and, more importantly, begin to simplify our lives. ■

Patrick was a founding member of the World Wide Web Consortium and the vice president for Internet Technology at IBM until retiring in late 2001. The author of *Net Attitude*, Patrick now writes, lectures, serves on boards and shares his thoughts via a Weblog at patrickweb.com.

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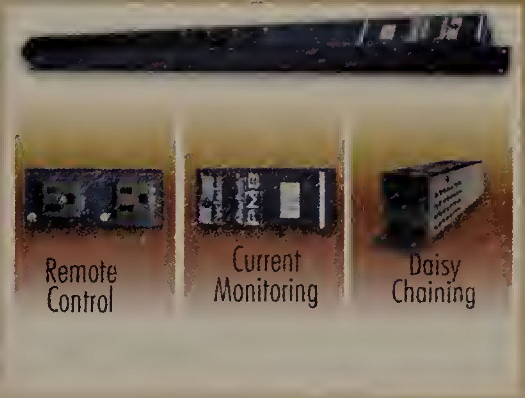

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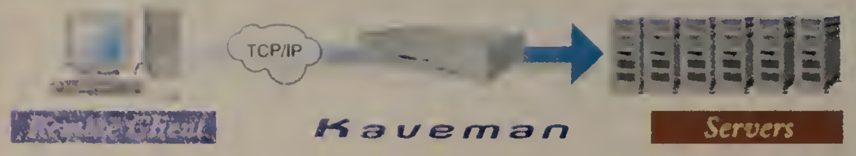

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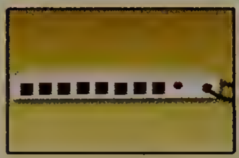

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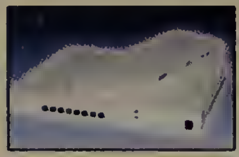

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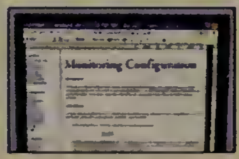

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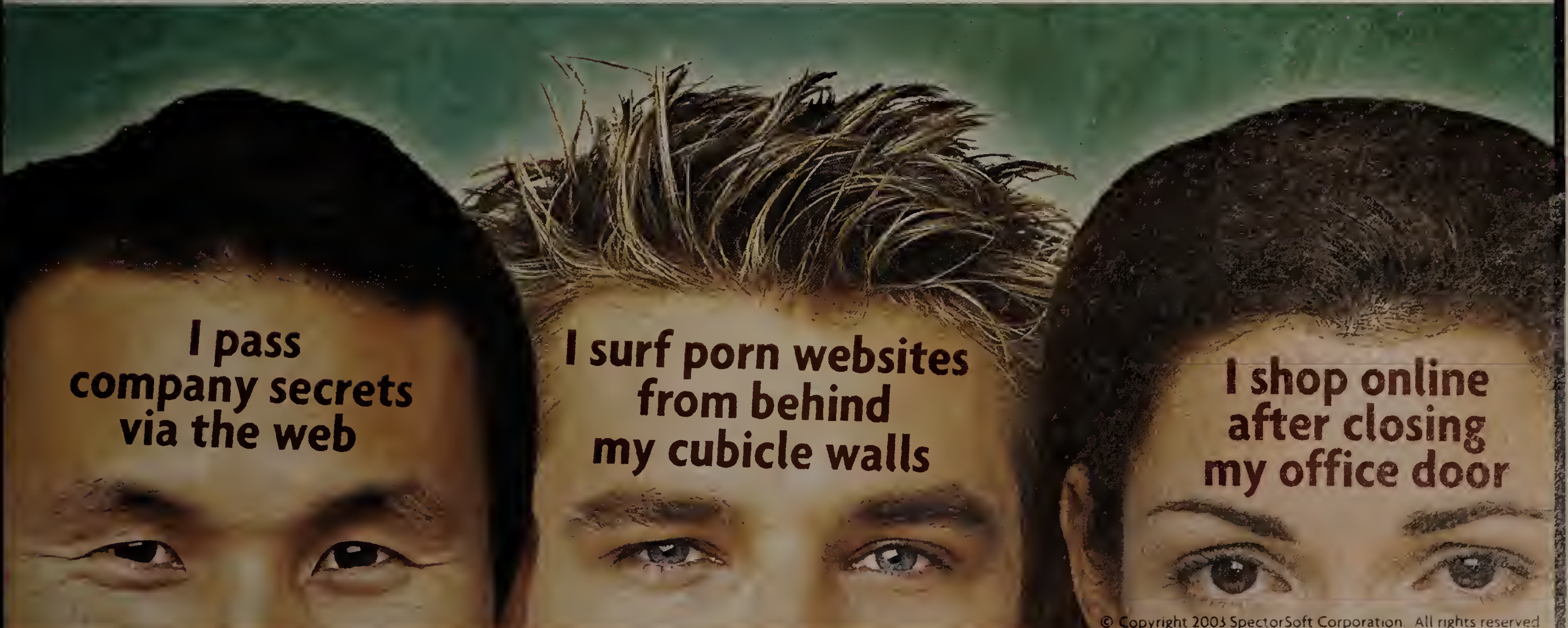
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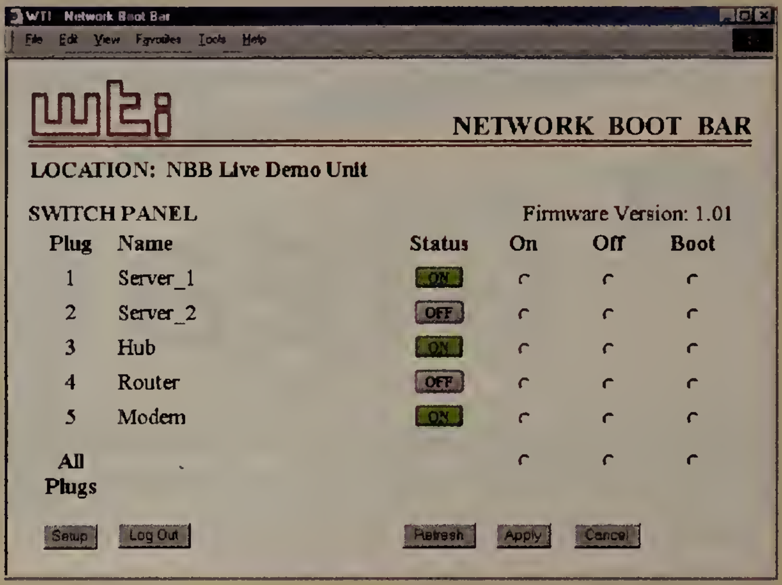

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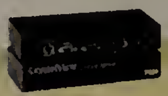

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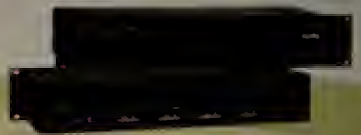

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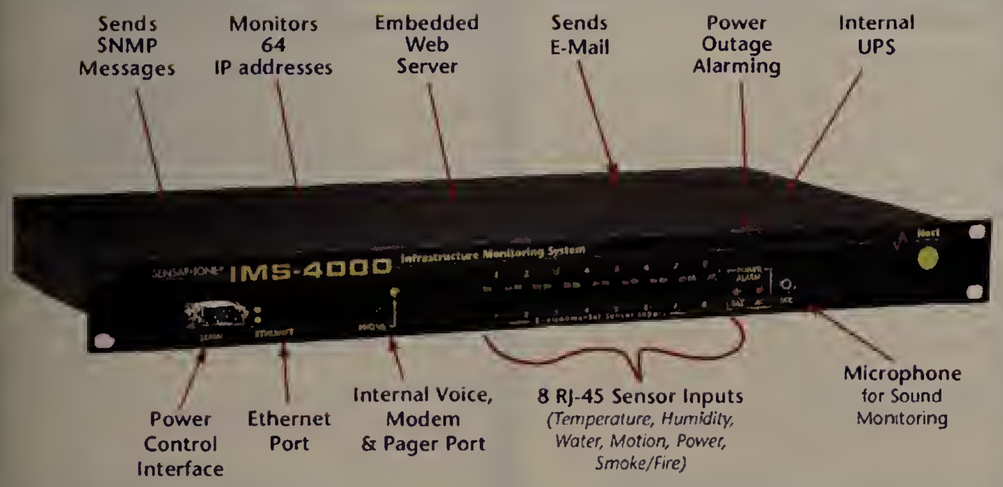
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IT Careers in E-Government

When Karen S. Evans, the former CIO for the Department of Energy, was named administrator for the Federal E-Government office, she inherited a list of 24 major information technology initiatives – due by year-end 2004. They're divided into buckets – Government to Citizen, Government to Government, Government to Business, and Internal Efficiency and Effectiveness. Simple labels for a complex web of myriad IT programs and projects that link federal, state and local governments with one another, with citizens and with businesses.

However, the E-Government movement doesn't end in this country. E-Government efforts are a major priority as reflected by professional conferences being held in India, Italy and Estonia. In the United Kingdom, the national healthcare system resides on the web, for scheduling of appointments to record access.

The challenges faced seem simple, but never ending. To tighten management and processes – to make them more accessible, more effective, and more responsive – E-Government will use information technology to create improvements. A Federal Enterprise Architecture has been developed, and now the various agencies are looking for ways to use past investments in finance and human resources systems, for example, and to upgrade systems that link and cooperate with one another.

While Congress mandated the IT upgrade across all agencies, it also used the E-Government Act to address the issue of people and staffing. The federal agencies, through the Federal CIO Council, assessed existing skills and gaps – defining IT security, project management and solutions architecture as the most important skills to achieving the 24 initiatives. The council also found that gaps do exist and that many IT project leaders needed additional technical skill. In addition, the E-Gov staff provides policy and analysis, skills that are needed on top of the technical competency. "The solution architect is a new breed (for us) – someone who investigates and recommends process, software applications and hardware solutions to the reengineered processes emerging from implementation," said an E-Government official.

The E-Government Office's lead contractors – from giants Lockheed Martin and Northrop Grumman to 4,000-employee Symantec – face the same dilemma. They need qualified project managers and architects; they need people who can analyze and make recommendations, and they need them now. One of the very first projects of E-Government, designed to improve and reduce cycle time for gaining security clearances, is part of the recruiting issue. "One of our E-Government initiatives, E-Clearance, eases the application process significantly as an electronic version is now available to agencies vs. the multi-page paper version many of us have endured," said the E-Government official.

HINT

When looking for intern and co-op jobs, check to see if your employer can initiate a security clearance. It's one of the hurdles in working in IT for contractors and federal agencies.

Another E-Government initiative, CyberCorp Scholarship program, is matching graduate security specialists to fill requirements across the federal government. And, this fall, the Federal CIO Council, as mandated by the E-Government Act, conducted the first Federal Clinger-Cohen IT Workforce Assessment Survey. The results will be used to assess whether federal agencies have the IT skills and professional certifications needed and to aid in recruiting, retention and development planning. Watch for results of the study at www.whitehouse.gov/omb and click on EGov.

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Falcon Farms, a fresh cut flower importer seeks: Computer Programmer: Develop/implement industry specific software to provide support for operational growth & projections. BS/equiv in Comp. Sc./Syst. Engr w/rel. exp. in flower industry. Resume to: Ref #201, HR, 1401 NW 78 Av, Miami, FL 33126.

Technical Lead: Take business requirements and define a technical architecture. Responsible for collaborating with colleagues on system integration and software architecture and working with business consultants to understand customer requirements. Will develop and demonstrate best coding and design practice. Further, design and develop applications, develop server-side Java/J2EE, design and optimize relational database schemas, and develop network applications. Requires: Masters in Math, Physics, Computer Science or related field with no experience or Bachelors in Math, Physics, Computer Science or related field with three years experience in Software Design and Development. 40hrs/wk (8:00 A.M. to 5:00 P.M.); $95,430.00/ yr. Send two resumes/responses to: Case Number 200203262, Labor Exchange Office, 19 Staniford Street, 1st Floor, Boston, MA 02114

Security Applications Software Engineer
SSH Communications in Palo Alto, CA seeks Security Applications Software Engineer to perform entry-level research, design, and development of security applications and software. Will write detailed descriptions of customer needs, program functions, and steps required to develop and use SSH, IPSec, IKE, X.509 Technology Toolkits and other software computer programs. Will explain integration with security acceleration chips and work with tech support group utilizing Windows NT/98/2000, Linux, NetBSD, Solaris, VxWorks Enhance. Must have Bachelor Degree in Computer Science, or equiv. 1 yr security software exp, and detailed knowledge of X.509 and PKCS, IKE and IPSec, IP, L2TP, and ASN.1. Fax resume to H R. at 650-618-2601.

Computer

Systems Analyst in Trumbull, CT to design, develop, implement, maintain, and fine-tune Windows NT as well as tandem-based real time systems operating in Guardian environments using C/C++, COBOL, Java, DDL, TAL, and pTAL programming languages and Non-stop SOL, Enscribe, Enable and Enform database technologies. Industry experience and knowledge in financial products, market data preferred. BS in Computer Science plus 1 yr. exp. as Systems Analyst or, alternatively, 3 yrs. exp. as Systems Analyst. Please send resumes to: The Nasdaq Stock Market, Inc. , 80 Merritt Boulevard, Trumbull, CT 06611, or send electronically to careers.ct@nasdaq.com, ATTN: Human Resources. Please reference the following number on your resume, #200306. We are an equal opportunity employer.

Software Systems Engineer to research, design, develop and test operating systems software for multimedia internetworking in video streaming; design and develop Java Swing software with Sybase; use Web methods for integration on Sun Solaris and Windows NT, Java, JNLP, JBuilder, Embarcadero and Tomcat; use parallel and distributed computing and software engineering techniques. Require B.S. with three years experience (or M.S. with one year experience) in the job offer or any experience providing skills in the described duties. 40% travel to client sites within the United States required. Salary: $59,000 per year, 40-hour week, M-F Mail resume to: Vice President, Y&L Consulting, Inc., 605 17th Avenue, East Moline, IL 61244.

Lead Client Server Software Analyst, Columbus, GA. Debugging, design, and development of credit card processing and workflow automation system using Microsoft.NET, C Sharp, VB.NET, SQL Server.

Must have Bachelor's or equivalent in Computer Information Systems. Must have six (6) years of experience in an analytical, research, or project management environment in the credit card or software industry or related environment. Object Oriented and Event Driven programming experience using Visual Basic, SOL Server, XML, Oueuing, Microsoft VSS, working on enterprise wide applications, development and integration of Document Management and Workflow Automation Systems. Must have legal authority to work in the U.S. Please send resume demonstrating all minimum requirements to: Kern Alexander, 1600 1st Ave. Columbus, GA 31907. Ref #LCSSMA/KA18

Programmer/Analyst (3 positions) to analyze, design, develop, test, support & maintain n-tier, distributed & object oriented computer software apps for the IT, internet/intranet & telecom industries; Perform stated duties using Java, EJB, JSP, JNDI, SABA or DSET,. SOAP, XML, J2EE, JavaScript, HTML, Crystal, RationalRose, Oracle & Informix. Require: Bach Deg. (or foreign equiv.) in Comp. Sci, Math, an Engg. discipline, or closely related field, w' 2 years exp. in job offered or in the design & development of software applications; Paid travel to client sites within the U.S. is required; 8a-5p, M-F; Send resume to HG-HR, SysArch Inc, 3370 Commons Gate Bend, Norcross, GA 30092 (no phone calls please).

Programmer Analyst opening: 3
Software design and development, in Java, J2EE, Corba, OOP in a UNIX, environment, UML, RUP, rational rose, Clear Case, clear quest,orbix 2000, weblogic 8.X, Oracle, dream weaver, vignette. Minimum education of Bachelors in computer Science or related fields is required with 2-3 years of experience or masters in computer Science or related fields with 1-2 yrs of experience.
Programmer Analyst Opening: 3
Software design and development, in C/C++, Corba, OOP in a UNIX environment, UML, RUP, rational rose, Clear Case, clear quest, orbix 2000, weblogic 8.X, Oracle, dream weaver. minimum education of Bachelors in computer Science or related fields is required with 2-3 years of experience or masters in computer Science or related fields with 1-2 yrs of experience.

Send resume to:
Semafor Technologies LLC
3300 Holcomb Bridge Rd,
#212
Norcross,GA-30092

Programmer Analyst w/exp to analyze, design, test & develop data processing & software applications using SQL Server, XML, Visual Basic Script, ASP, Visual Basic, VBA, MS Access, MS Excel, T-SQL, Visual Source Safe, Crystal Reports, OLE-DB, Java Script, Visual Interdev, Rational Rose, Visio, Filenet & Panagon IDM. Send resume to: Global Software, Inc. 3200 Atlantic Avenue, Suite 200, Raleigh, NC 27604

Programmer Analyst- (Plymouth Meeting, PA) Research, design, & develop existing computer applications on Microsoft Windows system & other systems in conjunction with hardware product development Analyze, design, test & implement computer applications supporting the availability among Microsoft & other different operating systems Req'd Bach. Deg in Comp Science, Comp Eng'g or related field & 2yrs. exp in the job offered or as a Software Dev. Must have exp w/ C++, VB Script, & Java Must be a Microsoft Cert. Solution Developer Send resume to: Pinkerton Computer Consultants, 140 Broadway, 23rd Floor, New York, NY 10005. Attn: J Wighton.

Software Developer
Research/develop software per client needs using Java (J2SE, J2EE), C++, ASP, Net.Data, HTML/XML, JavScript on Win 98/NT/XP/2000, Linux, Solaris, AIX, AS400 QS; development using Jakarta Tomcat, WebSphere as primary app. server with Db2, Oracle, MS SQL Server, PostgreSOL as backend database; tech support as needed. Req. MS Comp. Sci. & 3 mos. exp. in job/Software Development Research or related. Mail resume to HR, TaxAutomation 2300 Glades Rd., Ste. 420W Boca Raton, FL 33431. No calls.

Corporate Computer Services (CCS) has multiple openings for System/Programmer Analysts for both entry & experienced levels (minimum BS). Skills in following areas C/C++, VB, Oracle are plus. We are small but we do not lay off. Attractive wage w/ benefits. Apply HR@ccsiusa.net

Meridian Technologies looks for IT professionals for various positions in the area of Oracle, SAP, SQL, Java, Web applications, Unix, etc. Candidates must have BS or equivalent with some IT experience. Travel required some positions. Please contact marali@meridiantech.net. EOE.

System Analysts to analyze, design and implement ecommerce and other solutions using SAP R/3, ALE, IDOC, EDI, Gentran, Mercator on Unix/Windows OS ; perform gap analysis of customer EDI reqs and business appls; create/maintain basic EDI Maps, EDI transactions; troubleshoot EDI errors, install/configure Gentran Server; document program development process. Require: BS or foreign equiv. in CS/Engg. (any branch) & 2yrs exp. in IT Travel involved. High Salary F/T. Resumes to: HR, Global IT Solutions USI, Inc., 600 Stevens Port Dnve, Ste 125, Dakota Dunes, SD 57049.

Prog Analysts to analyze, design/develop s/w appls using Java, JavaScript, VBScript, ASP, HTML, Weblogic, Qracle, SOL, COBOL, DB2, CICS under Windows, UNIX & MVS QS; perform unit, functional, integration, regression and systems levet testing, analyze user reqs, prepare design documents; develop & enhance online & batch programs, implement, install, test debug and modify new existing appls. Require: BS or foreign equiv. in CS/Engg (any branch) & 2yrs exp. in IT Travel involved High Salary F/T Resumes to: HR, Global IT Solutions USI Inc., 600 Stevens Port Drive, Ste 125, Dakota Dunes, SD 57049.

Seeking qualified applicants for the following positions in Memphis/Collierville, TN Senior Project/Process Analyst. Perform planning and analysis for complex projects, processes and/or ongoing programs. Requirements: Bachelor's degree* or equivalent in business, computer science, MIS or related field plus 5 years of experience in planning, project management or process analysis of IT projects. Experience with CVS also required. *Master's degree in appropriate field will offset 2 years of general experience. Submit resumes to Sibi George, FedEx Corporate Services, 1900 Summit Tower Blvd., Suite 1400, Orlando, FL 32810. EOE M/F/D/V.

Programmer Analyst w/exp to analyze, develop, code, implement custom S/W application using Java, ASP.Net, VB.NET, C#, Window Forms, Web Services, T-SQL, SQL Server, XML.NET, XSLT, Xpath, HTML, DHTML, Visio, Crystal Reports, MSMQ on Unix, Linux & Win/platforms. Design, build & administer database. Send resumes to: L.J. Burt & Associates, Inc. 222 Mandalay Canal, Irving, TX 75039. No in person resumes/interviews; only respond by mail.

Internet company seeks PhD Research Engineers responsible for innovative research. Interested applicants should send resumes to: K Wolfe; 1501 Salado; Mt. View, CA 94043. Visit www.google.com for additional information.

Systems Analyst/ ASP Developer to design/ support web applns., user reqs., sys. updates, develop new functionalities. Coding using ASP, VB, ADO, COM/DCOM, IIS Visual Interdev, VBScript, and JavaScript on NT platform. Interface with SOL Server using ODBC, Transact-SOL Stored Procedures, Triggers for Data Access. Analyze client specs., design data model, user interface and develop enhancements. Perform testing, monitor perf. & refine utilities. Oversee OA/OC. BS in Electronics or CS + 3 yrs. exp. in job duties. Apply to BCA, 2180 Satellite Boulevard, #325, Duluth, GA 30097 with proof of permanent work auth. Comp. Salary.

Prog. Analysts to analyze, design, develop appls using: C, VB, JavaScript, HTML/DHTML, EJB, JSP, ASP, Servlet, UML, Qracle, SQL under Windows OS; perform initial study of req and provide feedback; provide on site maintenance support, debug, modify, fine tune and perform code optimization. Require: BS or foreign equiv. in CS/Engg.(any branch) & 2 yrs of exp. in IT. High Salary. Travel Involved. F/T Positions available in Elgin, IL and Lower Gwynedd, PA. Resume to: HR, Fourth Technologies, Inc., 1108 N Bethlehem Pike, Suite 8, Lower Gwynedd, PA 19002. Specify location desired on resume.

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K&M Softech is looking for programmer/system system, software/project engineers or IT professionals. Both entry & experienced levels needed. Some positions require travel. Skills in C/++, VB, Oracle, SAP, SQL are plus. Please send resumes to Recruit@kmsoftech.com. EOE

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COMPUTER/INFORMATION TECHNOLGY - Cap Gemini Ernst & Young U.S. LLC is currently seeking individuals to fill Consultant and Manager positions in multiple locations nationwide, including Chicago, IL. Please apply on-line at http://www.us.cgey.com/careers/eRecruit.asp using Job Ref#1181 for Consultant or #1182 for Manager. EOE. NO PHONE CALLS.

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Software Engineers needed. Seeking qual. candidates possessing BS or equiv. and/or rel. work exp. Part of the req. rel. work exp. must include 3 yrs working w/ Java. Duties include: Perform web based app. development, & support/train staff on Java; Establish & maintain AS/400 & DB2 databases; Develop inter-process & inter-system comm. protocols. Work w/ Java, JSP, Web Sphere, & DB2/400. Send res., ref., & sal. req. to Bennett Technology, 1001 Industrial Pkwy., P.O. Box 569, McDonough, GA 30253.

Engineering Analyst needed in Austin, TX to research, design, develop automated test and measurement solutions and instrumentation hardware/software using LabVIEW, C and HMI software. Must have a Bach. in Engg and 2 yrs exp. in job offered or 2 yrs exp. in hardware and instrumentation for test and measurement. E-mail resumes to ruth.hale@vi-tech.com. Put code SE on the resume.

ObjectWin is looking for Programmer/System Analyst or other IT professionals. Applicants must have BS or equivalent. Skills in ASP.Net, B2B, VB, Java, HTML, VB.Net, XSL, CSS, MS CMS, SSL & MS certified preferred. Competitive wage. Apply at skarande@objectwin.com. EOE.

Techgene Solutions has openings for System Analysts or Software Engineers. Candidates must have BS with experience in Cobol, JCL, Oracle, SQL, etc. Travel may be required for some positions. We are small but stable. Competitive salary. Please apply at bapujik@yahoo.com. EOE

IT PROFESSIONALS:

Position: Manager (Glen Mills, Pennsylvania and other locations through the U.S.)
Responsible for software development & software package implementation across diverse industries with focus on systems architecture,design&development. Involved in projects spanning the entire life-cycle of systems development from requirements gathering, developing and maintaining codes to deployment, user testing and documentation. Engage in the global rollout of SAP & development of interfaces using Object-Oriented technologies including Java, Visual Basic, and C++. Build business applications with the back-end being relational databases such as Oracle and MS SQL Server. Responsible for writing various system administration applications using UNIX scripts. Engage in the design & implementation of a back office transaction processing for money markets utilizing Middleware technologies, as well as the integration of an SAP platform & third party systems using Middleware technologies including Tibco, IBM-MQ Series & Vitria Utilize SAP ABAP (Advanced Business Application Programming) & SAP interface technologies including ALE (Application Link Enabling),EDI (Electronic Document Interface), Idoc (Interface Document), RFC (Remote Function Calls) & BAPI (Business Application Programming Interface). The wage offered is $99,328 per year. The work schedule is Monday-Friday, 9:00 am to 5:00 pm. The minimum requirements are as follows: Bachelor's degree or equivalent in Computer Science, Math, Information Systems, Engineering (any) or Business Administration + 5 years of experience in the job offered or 5 years of experience as a Senior Consultant, Senior Applications Developer, Consultant, Senior Systems Engineer, Systems Engineer, Senior Developer or Multimedia Consultant. Employer will regard a foreign degree to be equivalent to a U.S. Bachelor's degree as determined by an accredited credentials evaluation service. Related experience must include 3 years of experience in Relational Databases (Oracle and SOL Server), VB (Visual Basic) Object Oriented Technologies, SAP Interface Technologies (Idoc and BAPI), SAP ABAP (Advanced Business Application Programming), UNIX Scripts, and Java.

Please send your resume, referencing Job Order Number WEB367380 to the:
PA Dept. L&I
235 West Chelten Avenue
Philadelphia, PA 19144

COMPUTERS-OH Sftwre Devlpmnt firm seeks Sr. Sftwre Analyst to analyze/design/enhance and customize existing business apps/develop new apps; study/analyze apps and support systems; continual interactions w/customer mgmt providing feedback; revise system parameters to meet customer reqs; determine potential risk, impact and desired performance of the system; design/develop program interface modules using PL/SOL and SOL*Plus; design database tables, create indicies, add program constraints. Min req is Bachelor's in Mech. Eng (or equiv) and 2 yrs in-job/job related exp., including exp w/Oracle SQL, Oracle Forms, Windows NT, Sun Solaris, SOL*Loader, and Pro*C. Travel req. Resumes and cover ltrs (no calls) to CorelVal Consulting, Inc., c/o R. Emmons, 6161 Oak Tree Blvd., Ste 450, Indpendence, OH 44131. EOE.

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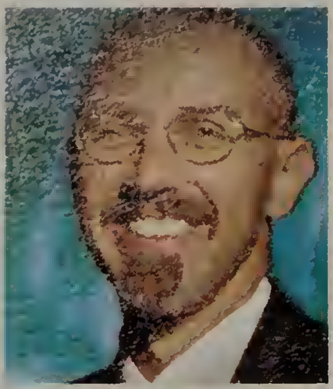


Bizarre and inexplicable visions

> *"There is a theory which states that if ever anyone discovers exactly what the Universe is for and why it is here, it will instantly disappear and be replaced by something even more bizarre and inexplicable. There is another theory which states that this has already happened."*
>
> — The narrator in *The Hitchhiker's Guide to the Galaxy* by Douglas Adams

A recent story in *The New York Times*, "News Analysis: The Internet, Act II: A clash between titans," noted that last year Sam Palmisano, the CEO of IBM, outlined the company's vision called on-demand computing, and at Microsoft's Professional Developers Conference a couple of weeks ago, "Bill Gates ... was set to present his company's notion of ... seamless computing."

The story went on to say that, "Behind the marketing shorthand is a kind of war of ideas over what can be thought of as the Internet, Act II, a technological evolution that has been gathering pace." The Internet, Act II? You mean Act I finished and I missed it? Darn.

According to this same story, Act I was all about e-mail and the Web and data downloads such as music and video. OK, I'll buy that. Act II "should bring all kinds of automated transactions among businesses and individuals. And those transactions will be able to include a hint of computer-aided intelligence."

I'm not sure where exactly the *Times* got these ideas about Act I and II, but much of the stuff supposedly arriving is arguably already in place. For example, I just purchased airline tickets using an automated online transaction, and there was a hint of machine intelligence involved.

Why is it that so many commentators, pundits and analysts want to try to peg down trends based on the flimsiest shreds of evidence? Is it for bragging rights, to be able to say, "I spotted that first"? Or is it an attempt to buy a ticket on the gravy train of consulting and writing?

Anyway, where things in the story get back on the rails of relevance is in pointing out that Microsoft thinks IBM's model is flawed (relevant but not a surprise). Gates is quoted as saying in a recent interview that, "IBM is talking about taking all the things we do now and outsourcing it. . . . The utility model suggests that it is not about empowerment."

The idea that Microsoft has a better model on the basis of a bucketful of marketing hype and some stage displays of its next operating system release is nonsense. It's just as nonsensical as IBM trying to convince us that we can outsource on the scale the company would like us to.

While this kind of outsourcing could theoretically be done, the issues of performance, reliability and security are nowhere near resolved. This makes the idea of serious relevance to the market meaningless for a long time to come.

But Gates' assertion that "the utility model suggests that it is not about empowerment" is just as meaningless.

Empowerment? What kind of black hole of logic have we just barely missed being swallowed by? The idea that Microsoft offers empowerment in some more profound way than IBM is so silly that we have to forgo using the word "nonsense" and resort to "ludicrous."

I have a theory that whenever we, the great unwashed that are the technology marketplace, get too close to understanding exactly what Microsoft, IBM, Oracle, Sun, HP and all the other big technology players are talking about with their "visions" (also known as spins), the visions instantly disappear and are replaced with something even more bizarre and inexplicable. I have another theory that says this already has happened. Over and over and over again.

Repeat your thoughts, repeat your thoughts to backspin@gibbs.com.

'NetBuzz News, insights, opinions and oddities

By Paul McNamara

Ninety-seven senators can be wrong

The vote in your United States Senate was 97 to 0 — generally the kind of bipartisan unanimity reserved for proclamations supporting National Bran Muffin Month and the like.

So you might think that 97 senators all in agreement on a particular issue couldn't possibly be wrong, right?

Silly you.

In this case, the 97 like-minded lawmakers were lined up behind a piece of anti-spam legislation called Can Spam that started out promising a modicum of relief from junk e-mail but then ran headlong into the propeller blades of Washington politics.

Oh, proponents still argue that the legislation is better than doing nothing. And that old bromide might be comforting if not for this nagging fact: The legislation is not better than doing nothing — it's a far sight worse — unless you happen to be a spammer or a corporate marketing executive who's been itching to become one.

The House of Representatives is expected to take up its own anti-spam legislation any moment now, and if that body demonstrates the same paucity of wisdom and backbone as the Senate — as is likely — President Bush can look forward to seeing the nation's first anti-spam legislation reach his desk. He shouldn't sign it, but he will.

That there is good to be found in the legislation matters little. Can Spam is fatally flawed for a variety of reasons, but we'll concentrate here on only one.

By embracing opt-out as the official government-approved method of telling a spammer to stop spamming, the legislation essentially gives everyone permission to spam everyone else at least once.

You say everyone can already do that? True enough, but few legitimate businesses dare, given the stigma attached to doing so. That is bound to change the moment this legislation becomes law.

And while it's said that the preferred method of true spam fighters — opt-in — is politically a non-starter, that doesn't make opt-out the best fallback position. Maintaining the status quo would be far better.

Imagine the confusion for end users — particularly the less technically savvy — who have been told for years that responding to opt-out requests is a fool's errand that only confirms to spammers that they have reached an active e-mail address. This has been solid advice, and it's been taken to heart by many.

If opt-out becomes legally sanctioned, what does the advice become now?

Sure, an Amazon, Sears or Network World would do their best to respect your opt-out request. But what of the scammers and fly-by-nighters? Are we seriously expecting end users to differentiate between the two?

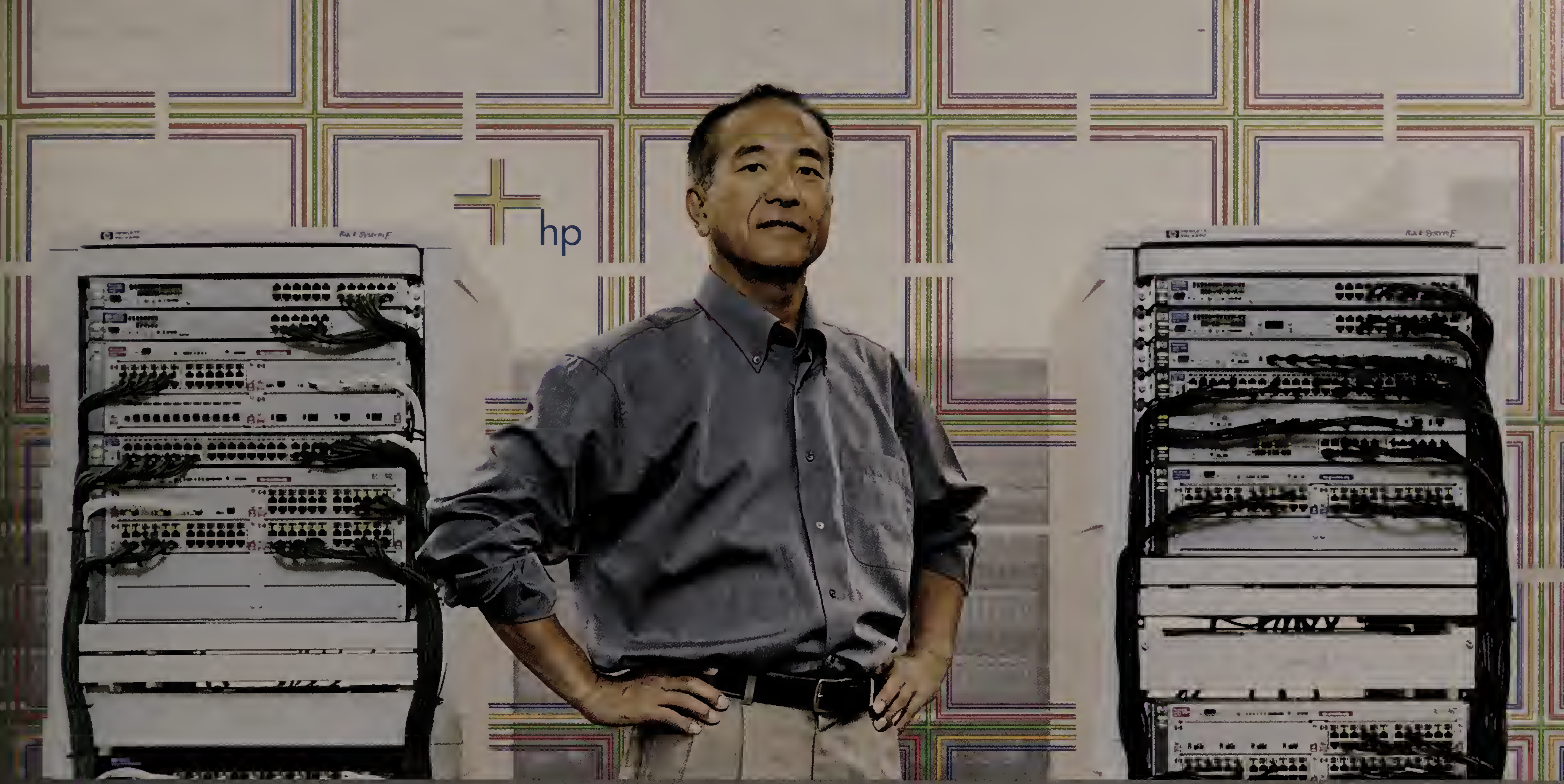
Once opt-out receives the government seal of approval, your options in dealing with spam become: a) Spend the time necessary to convey your opt-out wishes to the sender of each and every piece (and say so long to your morning); or b) Go on hitting the delete key as you do now and live with the consequences of having granted tacit permission for the spammers to send you more junk.

If a companion bill to Can Spam does pass the House and gets reconciled with the Senate version, you can bet the president's Texas ranch that he will sign it into law — no matter what details bedevil the thing. This embattled president isn't about to stand in the way of a law that's been widely peddled as an answer to spam.

The best-case scenario is that nothing emerges from the House but high hopes and hot air, or that House-Senate conferees find no acceptable compromise. If Congress is good at anything, it is inaction, so such a scenario is not far-fetched.

Keeping any bill from the president's desk might be the best hope we have.

You wouldn't believe the spam this address attracts: buzz@nww.com.



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